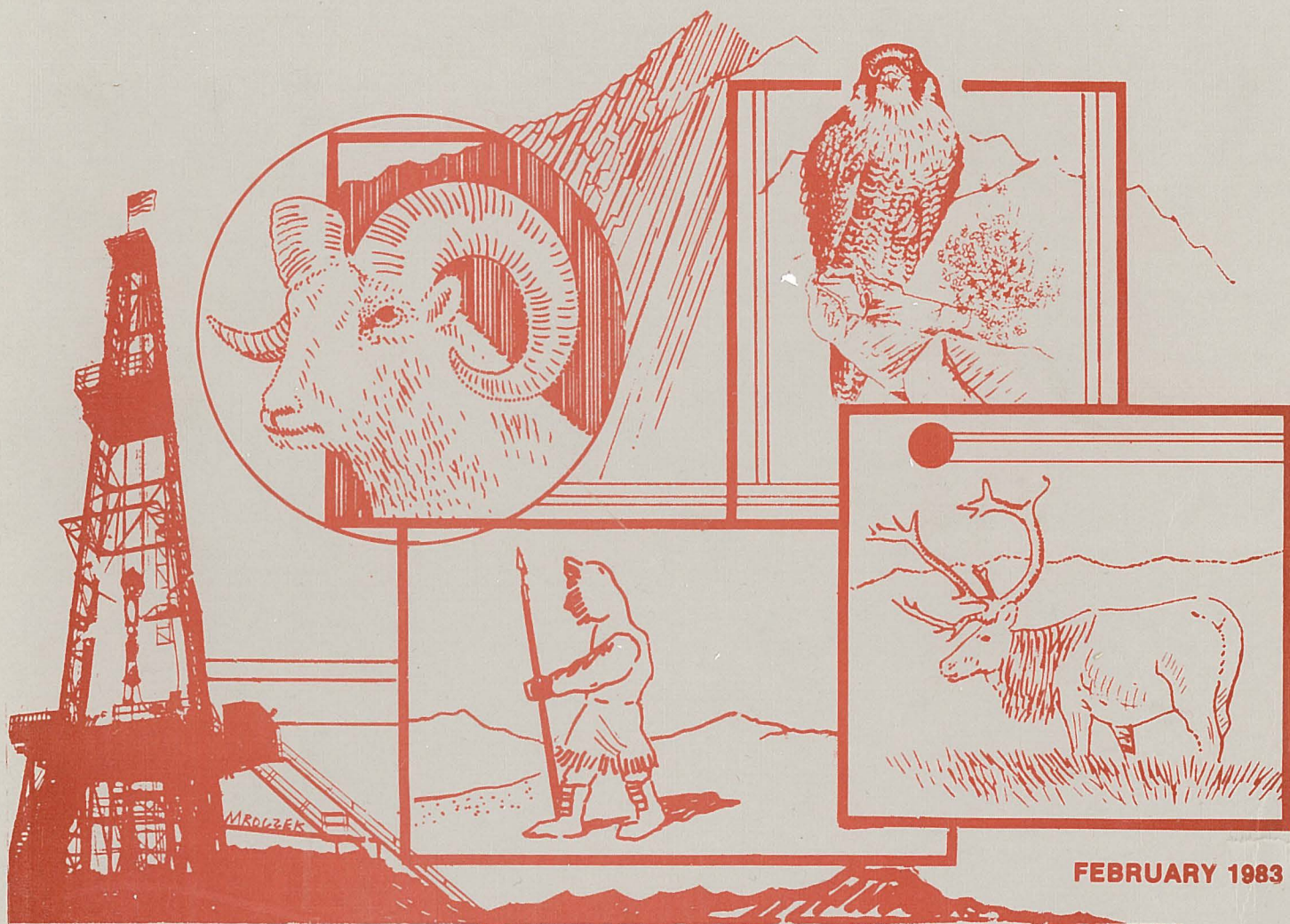


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**FINAL  
ENVIRONMENTAL IMPACT STATEMENT  
ON  
OIL AND GAS LEASING  
IN  
THE NATIONAL PETROLEUM RESERVE IN ALASKA**



**FEBRUARY 1983**

**U.S. Department of the Interior  
Bureau of Land Management**

**Alaska State Office  
701 C Street Box 13  
Anchorage, Alaska 99513**

**Released March 1983**



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THE UNITED STATES DEPARTMENT OF THE INTERIOR

FINAL

ENVIRONMENTAL IMPACT STATEMENT ON  
OIL AND GAS LEASING IN THE  
NATIONAL PETROLEUM RESERVE IN ALASKA

February 1983



PREPARED BY

THE BUREAU OF LAND MANAGEMENT  
NPR-A PROGRAM STAFF  
ALASKA STATE OFFICE  
ANCHORAGE, ALASKA

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BLM STATE DIRECTOR FOR ALASKA

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# United States Department of the Interior

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## BUREAU OF LAND MANAGEMENT

Alaska State Office  
701 C Street, Box 13  
Anchorage, Alaska 99513

FEB 25 1983

Dear Reader:

This Final Environmental Impact Statement (Final EIS) considers the potential effects of alternative methods of continuing competitive oil and gas leasing on the National Petroleum Reserve in Alaska (NPR-A). Lease sales in January and May 1982 and the development of alternative leasing programs with future sales in this Final EIS follow Congressional mandates expressed in P.L. 96-514, the 1981 Department of the Interior Appropriations Act. This Final EIS presents information that must be considered when a program for further leasing in the NPR-A is selected. Continuation of leasing increases the chances that petroleum would be discovered and produced. Any petroleum produced would provide numerous benefits to the State of Alaska and the nation but may also lead to some undesirable environmental and social loss as considered in this Final EIS.

This Final EIS was preceded by the publication of a Draft EIS on October 1, 1982; a series of meetings in Anaktuvuk Pass, Anchorage, Atkasuk, Barrow, Fairbanks, Kotzebue, Nulqsut and Wainwright to explain the findings of the EIS and to solicit comments; a formal Public Hearing in Barrow dealing with possible effects on subsistence, as required by the Alaska National Interest Lands Conservation Act; and receipt of comments on the Draft EIS through December 23, 1982. Before publication of the Draft EIS, the Department of the Interior conducted an intensive public involvement, petroleum exploration, and studies process beginning in 1976 with the passage of the Naval Petroleum Reserves Production Act. This process demonstrates that the Bureau of Land Management (BLM), acting for the Secretary, is committed to a program of full public discussions of the implications of BLM actions.

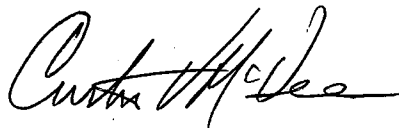
Comments received on the Draft EIS were constructive. Commentors expressed a variety of concerns, technical questions and procedural suggestions that have improved the analyses provided in this Final EIS. This EIS process provides a solid foundation for the selection of a program for continuation of competitive leasing in the NPR-A.

The selection of the leasing program takes place within a Record of Decision process that will follow release of the Final EIS.

The BLM may normally record its decisions (release the Record of Decision) at the same time as the Final EIS is published because BLM's appeals process complies with requirements of the Council on Environmental Quality (See 40 Code of Federal Regulations, Section 1506.10). However, because the BLM has benefited from public involvement in the decision process this simultaneous

release option is being waived. The Final Record of Decision will thus be released thirty days after publication of the Final EIS. This Record of Decision will formally balance the environmental and social losses from development against the economic benefits and national policy implications of a leasing program.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Curtis V. McVee".

Curtis V. McVee  
Bureau of Land Management  
State Director for Alaska



## EXECUTIVE SUMMARY

1. Type of Action: Public Law 96-514, the 1981 Department of the Interior Appropriations Act, mandated the Department of the Interior to implement an expeditious competitive oil and gas leasing program for the National Petroleum Reserve in Alaska (NPR-A). The Secretary has delegated this administrative action (rather than a legislative action) to the Bureau of Land Management (BLM).

2. Description of Action: This Final Environmental Impact Statement (Final EIS) is the National Environmental Policy Act (NEPA) compliance document required prior to finalizing decisions implementing an NPR-A competitive oil and gas leasing program. As envisioned in P.L. 96-514, this Final EIS considers all of NPR-A with appropriate conditions for inclusion in future oil and gas leasing sales exclusive of acreage previously leased in January and May 1982 under a Congressional National Environmental Policy Act (NEPA) compliance exemption. The impact analyses within this Final EIS are based on hypothetical and/or analogous examples of the types of industrial activities which may follow additional leasing in NPR-A. It concentrates on the possible effects on key (high risk) resources and issues derived from a preceding EIS scoping process (McVee, 1982) and Draft EIS comments as a means of developing the appropriate mitigations required by P.L. 96-514.

3. The Decision Process: The BLM prepared this Final EIS as an aid for making better decisions as required by Council on Environmental Quality (CEQ) guidance. The BLM deliberately has chosen to be concise and brief in this Final EIS to concentrate the public's attention on helping the BLM State Director for Alaska select a leasing strategy that best balances the Congressional objective of expeditious NPR-A leasing against the need to maintain a quality environment. The elements of any leasing strategy involve decisions on when to lease, where to lease (or where to not lease) and how to manage development. The BLM State Director for Alaska will select a leasing program for NPR-A based on the analyses of this EIS and on NPR-A studies conducted since 1977 that are incorporated into this EIS by reference. These decisions will be made in a Record of Decision (ROD) to be released 30 days after publication of this FEIS.

Consistent with aiding a decisionmaking process, this Final EIS places major emphasis on key resources and issues most at risk of being significantly affected by any industrial activity following the issuance of additional leases. These key resources and issues were identified in this Final EIS by comparison to three risk factors: vulnerability of the resource/issue (for example, a species that congregates seasonally in a restricted environment); sensitivity of the resource/issue to industrial activities; and the nature of mitigation (can effective mitigation be designed and applied).

Based on these risk factors and public comments received during the EIS scoping and Draft EIS processes, including extensive public meetings in Anchorage, Fairbanks, and in villages on or adjacent to NPR-A, this Final EIS concentrated its analyses on the following:

---

### Key Resources and Issues of the Final EIS

#### Resources

- °Caribou
- °Grizzly Bear
- °Polar Bear
- °White-fronted Geese
- °Black Brant
- °Peregrine Falcon
- °Other Cliff-Nesting Raptors
- °Fisheries

#### Issues

- °Sociocultural and Subsistence Issues
- °Recreation and Primitiveness

---

The BLM managers, in answering questions concerning the "when, where and how" of a leasing program for the NPR-A, designed "where" and "how" leasing alternatives since P.L. 96-514 sufficiently answered the "when to lease" question with a mandate to lease expeditiously. The Final EIS leasing alternatives compared and contrasted the following alternative leasing strategies:

- ° Standard Requirements Leasing: Continued use of special lease stipulations developed for the first two NPR-A lease sales combined with "normal permitting processes" (see Figure 20);
- ° Deletion: Deleting through BLM administrative procedures portions of NPR-A where the potential for significant environmental loss presently outweighs the perceived oil and gas value;
- ° Design Solution Leasing: Establishing through increased BLM/Permittee cooperation and a special lease stipulation a framework for developing effective mitigations in the permitting process;
- ° Seasonal Restriction Leasing: Development of further seasonal restrictions to conserve key resources/issues beyond those presently required in Standard Requirements special lease stipulations; and
- ° Deferral Leasing: Deferring through BLM administrative procedures the portions of NPR-A where ongoing studies will provide information useful in leasing decisions.

4. Alternative NPR-A Leasing Programs: The Final EIS analyzed three alternative leasing programs.

- ° Alternative A - Maximizing Discovery and Development Opportunities: This alternative would expose all of NPR-A in one lease offering with no deletions, deferrals or other special area designations. Only stipulations considered standard would be applicable and generally applied to permitting rather than the leasing process.

° Alternative B - Minimizing Presently Perceived Environmental Risk: This alternative would require a separate NEPA compliance document for each lease sale. It would delete large areas surrounding Teshekpuk Lake, in the Utukok Uplands, and along the Colville River (see Figure 21). In addition, all Special Management Zones (shown on Plate One), wild and scenic study river lands and the Alaska Maritime National Wildlife Refuge would be deleted. All deleted lands would be recommended for Congressional withdrawal. Identification of lease tracts would be accomplished by preparing a separate NEPA compliance document for each sale. These documents would also develop special lease and permitting stipulations for each tract to cover all potential impacts including specific compliance procedures.

° Alternative C - Balancing Development Opportunity and Environmental Risk (The Preferred Approach): This alternative would attempt to offer the majority of NPR-A's high potential oil and gas lands in five scheduled annual sales following the completion of a single programmatic EIS (this Final EIS). Deletions would be restricted to two areas (see Plate One) where effective mitigations have not yet been identified to allow for development. All petroleum activities would be subject to applicable special lease stipulations including those for Special Management Zones (see Plate One) established in areas of particularly diverse fish and wildlife habitats. The permitting process would stress BLM and applicant cooperation in the identification of likely impacts and design of effective mitigations.

5. The Final EIS Preferred Alternative Leasing Program: The recommendations of the Final EIS analysis are as follows.

° Sale(s) Location, Dates, Acreage Objectives, Reofferings: Sales would be held in Anchorage. Five sales would be scheduled each July from 1983 through 1987 to offer for lease an average of two million new acres (809,400 hectares) per sale. Sales beyond 1987 may be required to meet management objectives but are presently unscheduled. Reoffering of unsold tracts from the July 1983 and other future lease sales plus new acreage objectives may be a part of any sale beginning with the July 1984 sale;

° Pre- and Post-Lease Sale Procedures: All pre- and post-sale procedures will be in compliance with the Department of the Interior regulations and will stress public participation in the sale area selection process before each sale;

° Administrative Deferrals: The Fish Creek delta and adjacent salt marshes (see Plate One at the back of this EIS) will not be offered until the July 1987 lease sale. No Federal subsurface of village lands will be offered for lease until Arctic Slope Regional Corporation subsurface selection rights have been exhausted;

° Administrative Deletions: Areas in the Utukok Uplands and north of Teshekpuk Lake (see Plate One) have been administratively deleted from the envisioned leasing program because of high environmental values. Restoration of any deleted lands to the leasing program will require a public participation decision process to analyze the specific reasons and benefits of reconsideration;

° Special Lease Stipulations: Continued use of all special lease stipulations developed for the first two NPR-A lease sales with necessary modifications will be required on appropriate leases. A Special Management Zone stipulation will be applied to leases within applicable areas (see Plate One);

° The NPR-A Permitting Process: The NPR-A permitting process will require a high degree of permit applicant cooperation to ensure the design and implementation of effective mitigation under the Design Solution Alternative (see Chapters One and Five). The BLM will apply surface occupancy and seasonal restrictions as appropriate in the permitting process;

° Native Allotments, Village Surface Estates and Conservation of Subsistence Use: The BLM will not allow surface use of Native allotments or village surface estates without the approval of the surface owner. All leasing and permitting decisions will be made with consideration of conservation of subsistence uses;

° Recognition of Current Withdrawals from Leasing: Land within the administrative boundaries of wild and scenic study rivers and the Alaska Maritime National Wildlife Refuge are recognized as withdrawn from leasing until completion of applicable procedural requirements by Congress or the U.S. Fish and Wildlife Service, respectively;

° Further NEPA Compliance: Specific documentation of compliance with the National Environmental Policy Act beyond this Final EIS for the leasing program will be required for: all permitting processes, any proposed rights-of-way across deleted lands and all proposals to grant public access to any roads or airstrips built by or for a Lessee under BLM permit.

° Cooperative Studies and Continuing Coordination: The BLM will seek funding to conduct cooperative assessments of NPR-A's key resources and issues with other agencies and entities with a shared interest in NPR-A's management. The BLM will stress agency and public participation in all management processes for NPR-A even beyond those required by regulation to ensure that the best decisions are made.

6. Residual Impacts for Key Resources and Issues Under the Preferred Alternative: If the Preferred Alternative leasing program is adopted, there may be leasing and development within all areas not deleted from leasing. In addition, deleted areas may be subject to rights-of-way crossings subject to a decision following a specific NEPA compliance document. Despite all the mitigations proposed in the Preferred Alternative, there will be some level of residual impacts that would be apparent after application of recommended mitigations. The BLM believes that the only way to totally eliminate impacts is not to lease anywhere in NPR-A. However, such a "no-action" alternative would frustrate a legitimate objective of P.L. 96-514 that mandates the implementation of "an expeditious program of oil and gas leasing and development" in the Reserve. Although BLM as a steward of the public land would like to state that there would be no impact from its decisions, it cannot. Residual impacts that are likely to occur even with implementation of the Preferred Alternative on the following key resources and issues are listed below:



° Caribou: Any petroleum developments in NPR-A following leasing are likely to result in some degree of behavioral changes of caribou populations in NPR-A and adjacent areas. Under the conservation measures adopted in the Preferred Alternative, these behavioral changes are not expected to result in any catastrophic influences on the natural cycling of caribou population levels. However, it is likely that site-specific behavioral changes in response to development, especially to construction and use of a pipeline and haulroad corridor from NPR-A to a point of access to market, may alter present regional caribou distribution, at least in the short term, and may influence subsistence availability.

° Grizzly Bear: Further leasing resulting in developments in southern NPR-A is likely to result in a decrease in the potential carrying capacity for grizzly bears. Destruction of some human habituated or marauding grizzly bears in the interest of public safety is likely and may be more significant than any loss of potential carrying capacity.

° Polar Bear: Further leasing resulting in developments in the coastal areas of NPR-A may lead to a decrease in the potential carrying capacity for onshore winter maternity denning by females. Destruction of some marauding polar bears in the interest of public safety is likely but is not expected to be of significance to total population levels.

° White-fronted Geese and Black Brant: With the Special Management Zone (SMZ) stipulation and deletion of lands north of Teshekpuk Lake, further leasing leading to development in NPR-A is not expected to result in any significant loss of carrying capacity for these two species.

° Peregrine Falcon and Other Cliff-Nesting Raptors: Protection and conservation measures within the Preferred Alternative including restrictions on increased recreational access via new NPR-A roads or airstrips should eliminate any development impacts of significance to the endangered peregrine falcon or other raptor populations on the Reserve. However, since the ownership patterns along the Colville River outside of the NPR-A are a mosaic of Federal, State and private lands, effective management for potential impacts beyond NPR-A petroleum developments will be a joint responsibility of Federal, State and North Slope Borough authorities.

° Fisheries: With the stipulations provided by the Preferred Alternative to protect fisheries resources, especially those populations of subsistence importance during any NPR-A development, no impacts of long-term significance are expected. However, the destructive effects of petroleum products entering the aquatic system through accidental or sabotage related spills from facilities or pipelines are recognized. The requirements for effective containment and clean-up will be stressed and only a few isolated events of local and short-term significance are predicted.

° Sociocultural and Subsistence Issues: Any NPR-A developments will aggravate and potentially increase the rate of sociocultural change now affecting North Slope residents. Not all impacts will be negative. Any NPR-A developments will increase the tax base and potentially the tax revenues of the North Slope Borough allowing the goals of full employment and modernization of village

infrastructures to continue. Leasing under the Preferred Alternative requires the BLM to consider and conserve the subsistence uses of the Reserve. However, any residual impacts predicted for fish and wildlife resources, especially any changes in present distribution even with no change in total population level, will be reflected as a required change in the present subsistence lifestyle.

° Recreation and Primitiveness: Leasing under the Preferred Alternative will have little or no effect on the present level of NPR-A's recreational use. In addition, Lessees and Permittees will be required to limit the off-duty recreational activities of workers to those that will not produce measurable impacts on the environment. The BLM will manage the NPR-A with the preservation of its primitive nature as a legitimate multiple use objective. However, further leasing, if it leads to development, will alter the present primitive aspects it now possesses although all permitting processes will seek to minimize these alterations by application of proven visual and primitive condition conservation measures.

#### 7. Short- Versus Long-Term Productivity and Final Resources Commitments:

The BLM through the application of multiple use management objectives to all NPR-A activities will strive to prevent the loss of any significant long-term productivity of renewable resources while allowing the short-term extraction of petroleum from the Reserve. The BLM recognizes that further leasing that leads to development will result in the final commitment of any petroleum extracted from the Reserve as depletion of a nonrenewable resource. The agency recognizes as well that the final commitments of considerable human, financial and energy resources expended in petroleum extraction would be lost in an alternate opportunity sense. The BLM believes that by controlling the proliferation of facilities through the permitting process, the effects of long-term commitments on productivity will be limited and manageable through a continuing monitoring and mitigation process and by requiring the rehabilitation of all use sites upon abandonment to some measure of original productivity.

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## CHAPTER ONE. PURPOSE FOR ACTION AND LIMITATIONS ON AGENCY DISCRETION

### I. PURPOSES FOR ACTION

In the Department of the Interior Appropriations Act of 1981, P.L. 96-514, the U.S. Congress gave the Secretary of the Interior the authority to conduct a competitive oil and gas leasing program on the National Petroleum Reserve in Alaska (NPR-A) under the guidance of 43 Code of Federal Regulations (CFR) 3130. The Secretary also was directed to provide for such conditions, restrictions and prohibitions as necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of NPR-A. Regulations governing the "mechanics" of leasing once tracts have been selected and appropriate environmental mitigations have been designed were already in final form before initiation of this EIS process. Therefore, the "Proposed Action" to be analyzed in this EIS is the appropriate method of mitigating reasonably foreseeable and significantly adverse effects on surface resources on and adjacent to NPR-A stemming from the Congressional mandate to expeditiously lease within the NPR-A. This EIS recommends a "Preferred Alternative" method for carrying out an oil and gas leasing program on the NPR-A (see Chapter Five and Plate One in the back of this EIS). This alternative balances the mandate to develop subsurface resources and the need to conserve surface resources on and adjacent to the NPR-A.

The NPR-A is a 37,000-square-mile (96,000-sq-km) area of Federal land lying between the Brooks Range and Arctic Ocean on the North Slope of Alaska (Figure 1). Potential impacts of activities that could result from oil and gas leasing in NPR-A are presented in this Environmental Impact Statement (EIS) based on NPR-A specific or analogous literature and hypothetical models. The EIS identifies and discusses the meaningful alternatives for both encouraging oil and gas development and protecting surface resources. It proposes a "Preferred Alternative" (Plate One in the back of this EIS) intended to support a balancing of the nation's need for energy and the need to maintain and enhance the quality of the human and natural environments. A premise of this EIS is that a quality environment includes natural areas preserved and managed for the benefit, enjoyment and education of the people. This EIS discusses alternative ways to promote oil and gas activities that will have a net beneficial effect on the quality of life. It recognizes the historic uses of public lands by rural Alaskans and attempts to minimize disruption of those uses.

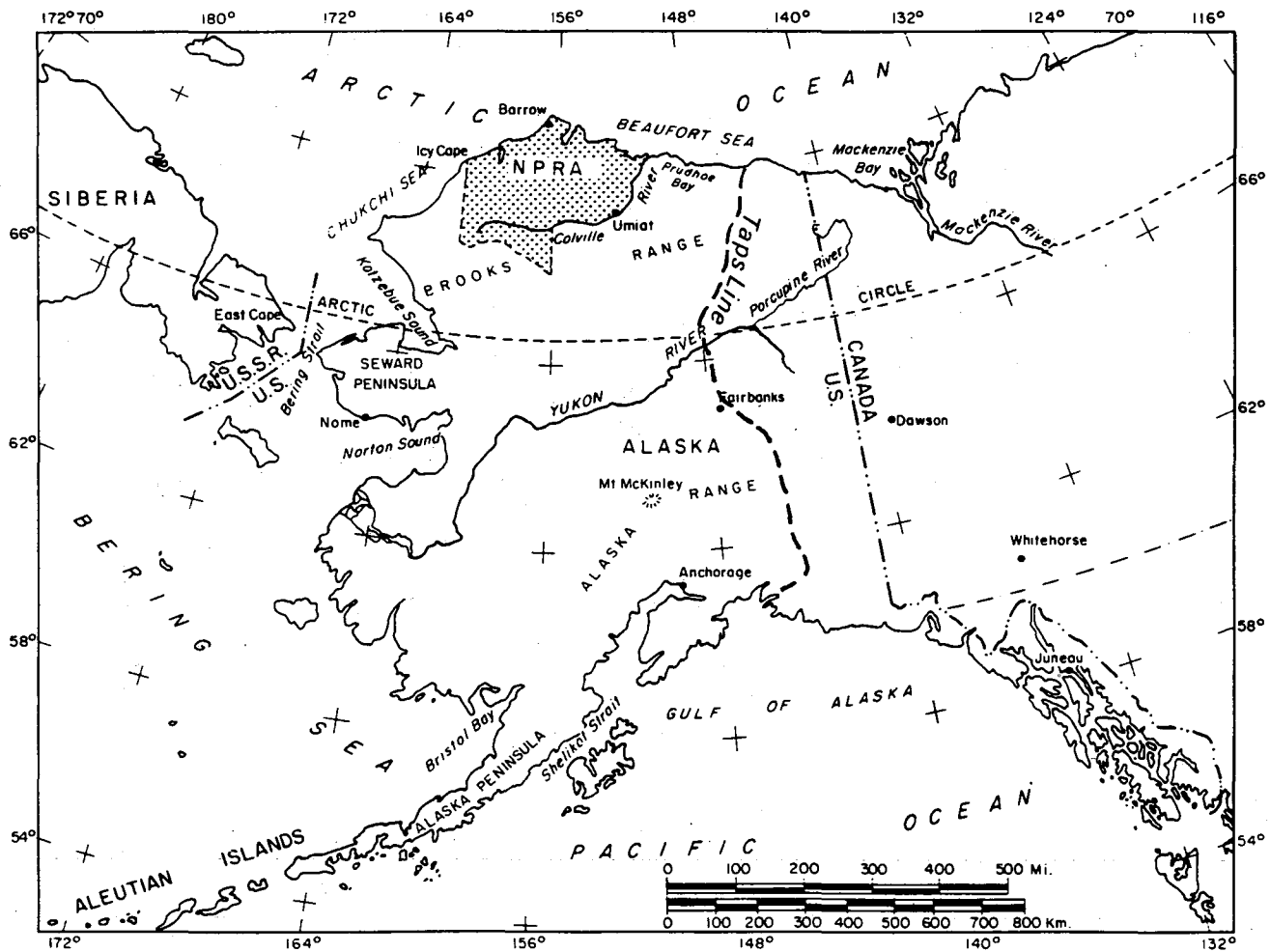
All projects such as exploratory wells, pipelines, roads, and field developments will require further specific National Environmental Policy Act (NEPA) compliance beyond this EIS. If the approval of any project(s) would constitute a major Federal action, a project specific EIS(es) will be prepared.

The leasing program analyzed in this EIS in one sense is the beginning of exploration for, and possible development of, the oil and gas resources which may be within the Reserve. In another sense, it is the culmination of a Federal program that began in 1944 with exploration and expanded in 1977 to a study program of alternative uses of Federal lands in NPR-A that recommended the best use or uses of the area. These preceding studies and decisions referred to in Table 1 are in part the background for this EIS.



FIGURE 1

# LOCATION OF NPR-A



SOURCE: TETRA TECH, 1982

T A B L E 1  
NPR-A MILESTONES

<u>ERA</u>	<u>EVENT(S)</u>	<u>BRIEF DESCRIPTION</u>
1923	Naval Petroleum Reserve No. 4 (NPR #4 or "Pet-4") Designated	President Harding recognizing an oil and gas potential on the North Slope and the economic and environmental difficulty of its development set aside an area as a strategic Reserve to be administered by the Department of the Navy.
1944 - 1953	Early Naval Exploration of "Pet-4"	Exploration under this program began in 1944 and ended in 1953. It resulted in 45 shallow core-test wells and 36 test wells, including four near Barrow. The Department of the Navy acquired nearly 3,400 line miles of seismic reflection data, nearly 400 seismic refraction profiles, gravity data from more than 6,000 stations, and 12,600 flight line miles of aeromagnetic data.
1972 - 1977	Further Naval Exploration	The Department of the Navy's second exploration program began in 1972 and from 1974 to June 1977 completed seven test wells outside the Barrow area, nearly 7,700 line miles of seismic surveys, and gravity surveys at more than 30,000 stations.
1976	Passage of the Naval Petroleum Reserves Production Act (P.L. 94-258)	On June 1, 1977, jurisdiction of the Reserve was transferred to the Secretary of the Interior and its name became the National Petroleum Reserve in Alaska. Exploration was assigned to the U.S. Geological Survey (USGS). On June 3, 1977, the Secretary of the Interior designated three Special Areas on NPR-A (43 FR 28723) which imposed specific restrictions on any activities capable of disturbing sensitive wildlife uses in the Teshekpuk Lake, Utukok Uplands and Colville River Bluff areas.
1977 - 1980	105 (b) and (c) Study Programs Under P.L. 94-258	The Section 105(b) and (c) studies were compiled by specialists from a variety of disciplines who analyzed existing and potential uses of the NPR-A; they identified key species that play a role in maintaining the Arctic ecosystem(s), determined their response to human activity and made recommendations for future management.
1977 - 1981	USGS Exploration Under P.L. 94-258	The USGS continued to explore and evaluate NPR-A petroleum resources, develop and produce gas from the south Barrow gas field, and rehabilitate areas disturbed by previous exploration efforts. The USGS completed 21 widely scattered test wells (for a total of 28 in the program); about 5,700 line miles of seismic surveys; gravity surveys at more than 27,000 stations; and limited aeromagnetic surveys. Gas and oil shows were observed at several test wells.
1980	Department of Interior Appropriations Act for 1981 (P.L. 96-514)	Congress mandated an expeditious program of oil and gas leasing of two million acres by August 1982 exempt from any NEPA compliance.
1981	Final Environmental Assessment, NPR-A Oil and Gas Leasing	Identified lands to offer at the first two NPR-A lease sales.
1981	Final Regulations Adopted	Regulations to authorize leasing and manage oil and gas activities in the Reserve were adopted (43 CFR 3130).
1982	First Two Lease Sales Held	Lease sales held in January and May of 1982 in Fairbanks, Alaska, resulted in the leasing of 905,585 acres.

## II. LEGISLATIVE DIRECTIVES

Undertaking a leasing program requires compliance with all applicable laws and guidance. The following summary of such laws and guidance applicable to NPR-A leasing also reflects the management ethic and decisionmaking processes followed by the BLM as stewards of the public land.

### A. The Department of the Interior Appropriations Act of 1981 (P.L. 96-514)

This Appropriations Act specifically waived requirements of the National Environmental Policy Act for as many as two sales so long as not more than two million acres (809,400 hectares) were sold. The BLM used an Environmental Assessment (EA) process as the vehicle to select areas best suited for these initial sales. The decisions made during this environmental assessment process are contained in the National Petroleum Reserve in Alaska (Final) Environmental Assessment Federal Oil and Gas Lease Sale of September 1981 (USDI/BLM, 1981). Lease sales held January 27, 1982 and May 26, 1982 initiated the competitive oil and gas leasing envisioned by Congress in the Appropriations Act.

Congress also incorporated Section 104(b) of the Naval Petroleum Resources Production Act of 1976 into the Appropriations Act. It designates extraordinary protection for surface values within the NPR-A for the ecologically valuable Utukok caribou calving and Teshekpuk bird molting areas.

Other social and environmental protective measures addressed in the Appropriations Act are that:

- ° Revenues from NPR-A leasing and production that flow to the State of Alaska should be distributed by the State in a manner which gives a priority to the "subdivisions of the state most directly or severely impacted."
- ° "Activities undertaken pursuant to this Act shall include or provide for such conditions, restrictions and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources" of NPR-A.

### B. The National Environmental Policy Act (NEPA, P.L. 91-190)

As interpreted by the Council on Environmental Quality (CEQ), the NEPA process requires a Federal agency:

- ° To determine whether its decisions would so alter the human environment that the responsible Federal official should conclude that the proposed decision(s) constitutes a major Federal action; and if so,
- ° To initiate and prepare an Environmental Impact Statement (EIS).

To assist in this determination, the CEQ developed a means of analyzing EIS issues and decisions through a management tool called scoping which:

- ° Identifies highly regarded values such as rare plants or animals, scarce recreation opportunities, unique ecosystems and unusual features and/or other issues which are of great concern to the public;

- ° Involves the public in developing alternatives which would both allow the valuable new uses of the public land (in this case oil and gas development) and protect the highly regarded values, features, and areas to assure, as required by the Federal Lands Policy and Management Act (FLPMA) that "permanent productivity of the land" be maintained;

- ° Provides information to the decisionmaker in the Federal agency to help "sort" issues which require in-depth EIS analysis from those that do not.

C. The Naval Petroleum Reserve Production Act of 1976 (NPRPA, P.L. 94-258)

The NPRPA is central to leasing in the NPR-A because it:

- ° Transferred control of the Naval Petroleum Reserves from the Department of the Navy to the Department of the Interior. This signaled a Congressional desire that hydrocarbons on these Federal lands no longer should be reserved for future national defense but should be available to satisfy near-term economic objectives.

- ° Identified two ecologically sensitive "special" areas, the Utukok Uplands calving grounds of the Western Arctic Caribou Herd and the waterfowl molting areas near Teshekpuk Lake. The Act authorized the Secretary of the Interior to designate additional "special" areas calling for extraordinary protection of surface values within them. The Secretary subsequently designated the Colville River as "special" for protection of the raptor nests along the Colville and for its wild character.

- ° Authorized the Secretary of Interior to approve plans of operation within the NPR-A so long as he provides the Department of Justice with an opportunity to review such plans (antitrust review).

- ° Mandated NPR-A Studies under Sections 105(b) and (c) which provided a data base for decisions on total land use management as well as oil and gas development (USDI, NPR-A Task Force, 1979; USGS, 1979).

- ° Enabled the U.S. Department of the Interior to develop management guidelines for NPR-A (43 CFR 2360) by conducting oil and gas exploration work in portions of the Reserve to give an opportunity to experience the complexity of Arctic exploration activities. Projections of hydrocarbon potential resulting from this Federal exploration program also allowed the EIS preparers to compare the possible benefits from oil development with possible adverse environmental and social impacts.

D. The Federal Lands Policy and Management Act (FLPMA, 43 USC 1700)

The FLPMA passed in 1976 firmly established the principle of multiple use management of public lands. The multiple use principles contained in FLPMA instruct BLM:

to manage... the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people... a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including

but not limited to recreation, range, timber, minerals, watershed, wildlife and fish, and natural, scenic, scientific and historical values... harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

FLPMA has been determined to be generally applicable to NPR-A. However, Section 202 (Planning) and 603 (Wilderness) of FLPMA were specifically waived by Congress in the Appropriations Act (P.L. 96-514). By deleting Section 202, Congress allowed leasing without the completion of a comprehensive land use plan. By deleting Section 603, Congress allowed leasing in NPR-A without compliance with the ongoing BLM nationwide studies identifying lands for wilderness status.

E. The Alaska National Interest Lands Conservation Act (ANILCA, P.L. 96-487)

The ANILCA, passed in December 1980, provides Congressional mandates for managing the Federal lands in Alaska. Key provisions affecting NPR-A are:

- ° Title VI in which the Colville, Etivluk-Nigu, and Utukok Rivers are identified as wild and scenic study rivers. Based on an opinion of the Solicitor of the Department of the Interior, these rivers are withdrawn from oil and gas leasing until September 1984 to provide Congress with adequate time to determine whether they should be permanently designated as wild and scenic rivers.

- ° Title VIII provided a preference to subsistence households in the allocation of wildlife during shortages. Each Federal land managing agency, including the BLM, is charged with preserving maximum feasible subsistence harvesting on public lands consistent with other valuable land uses and sound biological principles. As required by ANILCA, the Alaska Department of Fish and Game (ADF&G) established six Alaska subsistence resource regions encompassing all public lands in Alaska. The Western Committee of the Arctic Regional Council has been involved with BLM in identifying strategies for protecting and enhancing subsistence while allowing for other valuable uses of the land, such as oil and gas production. BLM held a formal public hearing in compliance with Section 810 on November 22, 1982 in Barrow, Alaska. All testimony received has been considered in preparing this Final EIS.

- ° Under Section 905, individual Alaska Natives are entitled up to a 160-acre (65-hectare) allotment if they filed for the allotment prior to December 18, 1971.

- ° Under Section 1431(o), the Arctic Slope Regional Corporation (ASRC) may select subsurface mineral rights under village lands within NPR-A. This option could not be exercised until lands within 75 miles (120 km) of the village(s) had been opened for commercial development. NPR-A leasing based on the first two sales may have satisfied this requirement for lands within 75 miles of Wainwright, Atkasuk and Nuiqsut. If so, ASRC has until January 26, 1987 to exercise this option for Atkasuk, Wainwright and Nuiqsut. This right to exchange may affect the location and timing of BLM's leasing program in

NPR-A. To avoid needless confusion over who will ultimately lease village lands, the BLM is not considering offering any subsurface rights under village lands before ASRC exhausts selection rights.

° Section 303 (1) of ANILCA established the Alaska Maritime National Wildlife Refuge. This section states that "public lands on islands, islets, rocks, reefs, spires and designated capes and headlands in the Chukchi Sea" shall be part of the above-mentioned refuge. ANILCA further stated in Section 304 (b) that, with respect to these refuges (including the Alaska Maritime National Wildlife Refuge) "the Secretary (of Interior) may not permit any use...unless such use (including but not limited to any oil and gas leasing...) is compatible with the purposes of the refuge."

All islands, inlets, capes and headlands in the Chukchi Sea are within the Alaska Maritime National Wildlife Refuge. BLM will not offer for lease any refuge lands in the Chukchi Sea adjacent to NPR-A until a compatibility test has been applied by the U.S. Fish and Wildlife Service. Maps of this refuge are available from the U.S. Fish and Wildlife Service in Anchorage, Alaska.

#### F. The Coastal Zone Management Act (CZMA, 16 USC 1400)

When considering a decision which might directly affect the coastal lands and waters within the coastal zone, the BLM must do so "...in a manner which is, to the maximum extent practicable, consistent with approved State management programs..." (16 USC 1456).

The Preferred Alternative (Plate One) discussed in this EIS is designed to protect resources of the coastal zone through a combination of avoidance alternatives and design solutions. Avoidance alternatives include the deletion of sensitive habitats from consideration for leasing and/or the application of special management policies including surface occupancy restrictions to conserve sensitive habitats. The Preferred Alternative includes the establishment of requirements for regulating the operation or location of facilities and for mandating Lessee studies of the ecological relationship between key species and their habitats. These studies would form the basis for seasonal restrictions and for requiring the redesign of operations or facilities to minimize the effects of oil and gas activities including those in the coastal environment.

The State of Alaska, Office of Management and Budget (OMB) has reviewed the Draft EIS and offered their comments on the effectiveness of BLM's avoidance alternatives and design solutions. BLM has considered these comments and made appropriate changes in this Final EIS.

### III. THE NPR-A EIS PROCESS

Competitive oil and gas leasing is a type of Federal action subject to the requirements of the National Environmental Policy Act (NEPA). As interpreted by the CEQ, the benefit of NEPA is that it causes Federal agencies, including the BLM, to work toward making better decisions. In CEQ's words:

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork - even excellent paperwork - but to foster excellent action (40 CFR 1500.1).

Before the public can judge whether the BLM is making better decisions, it is necessary to clearly identify what those decisions are. To operate a leasing program, the BLM must decide:

- ° When to lease;
- ° Where to lease; and,
- ° How to manage oil and gas activities and developments in areas selected for leasing.

The question "When to lease?" was largely answered by P.L. 96-514 but has been analyzed with other alternatives in Chapter Five.

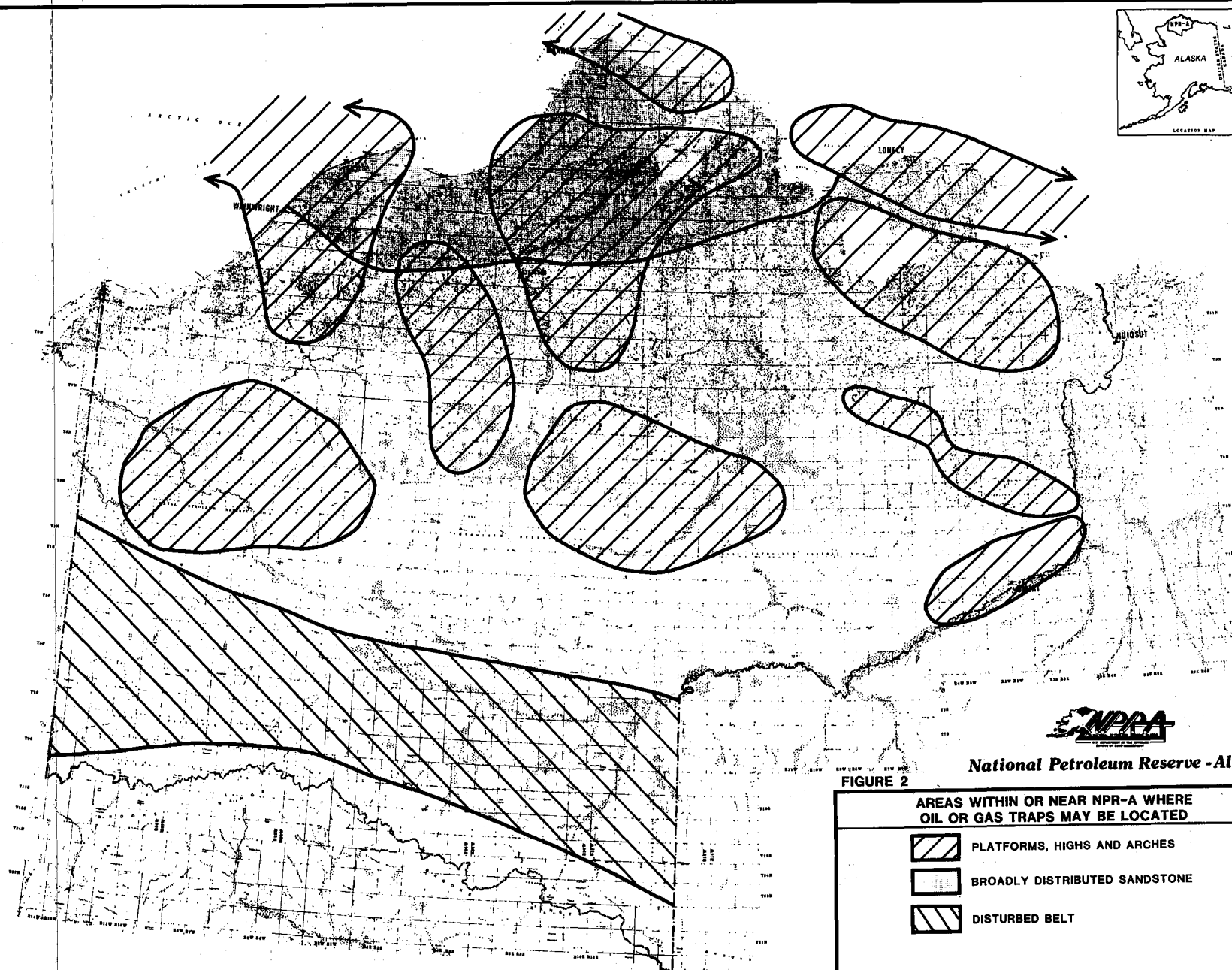
In answering the question "Where to lease?" the BLM reviewed information on the geology of the public lands to identify areas believed to have favorable petroleum characteristics. Lands that appear to have favorable petroleum characteristics, hereafter called "high potential lands," are shown in Figure 2. The BLM wants to offer high potential lands because:

- ° BLM funds and workers can be dedicated to a number of worthwhile programs. Using these scarce human and financial resources to "offer" lands for lease that do not have favorable petroleum characteristics would be a waste of those resources. The BLM is committed to using its funds and people in productive programs. Offering high potential lands is productive; offering lands lacking favorable petroleum characteristics is unproductive.
- ° The BLM staff can only process a finite amount of land to competitive lease sales in any given time period. Inevitably, the offering of lands with poor potential means that some high potential lands will have to be deferred to future sales. The deferral of high potential lands to future sales delays entry onto those lands by oil and gas firms. This delay in exploring and developing high potential lands may not be in the nation's interest.

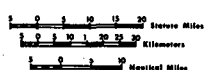
In answering the question "Where should we lease?" the BLM also considers adverse effects on the environment from oil and gas activities. By considering adverse effects on the environment, the BLM is turning the "Where to lease" question around and determining whether there are areas which should not be leased. In determining where not to lease, the BLM relies on the following multi-step public involvement process.

#### A. EIS Scoping

In the EIS scoping process, BLM outlined its concerns in a public document entitled Scoping Document for Future Oil and Gas Leasing in NPR-A released in February 1982 (USDI/BLM, 1982).



**GRAPHIC SCALE**






Universal Transverse Mercator Projection



**National Petroleum Reserve - Alaska**

**FIGURE 2**

**AREAS WITHIN OR NEAR NPR-A WHERE  
OIL OR GAS TRAPS MAY BE LOCATED**

-  PLATFORMS, HIGHS AND ARCHES
-  BROADLY DISTRIBUTED SANDSTONE
-  DISTURBED BELT

Source: Tetra Tech, 1982

FEBRUARY 1982



Using this document as a springboard, the BLM involved the public in discussions that identified certain wildlife and plant species (hereafter called resources), surface features and fragile, scenic or ecologically valuable areas as being "noteworthy." By noteworthy the BLM means that the resource, feature or area is highly regarded by the public and that adverse impacts to these resources, features or areas would be controversial.

Table 2 lists those individuals, organizations and governments that provided substantive comments during scoping.

---

T A B L E 2  
EIS Scoping Participants

<u>Organizations and Individuals</u>	<u>Government and Their Agencies</u>
Elders/leaders of Wainwright and Atkasuk	State of Alaska, Governmental Coordination Unit
Elders/leaders of Barrow and the Western Committee of the Arctic Regional (Subsistence) Council	State of Alaska, Department of Fish and Game
National Wildlife Federation	U.S. Department of Interior, Fish and Wildlife Service
Northern Alaska Environmental Center	
Tanana Chiefs Conference, Inc.	
D.W. Mitchell	
Exxon	
Amy Klar	
Mary Core	
Bob Dittrick	
Clayton White	
Alaska Center for the Environment	
Abbott Loop School, Anchorage	

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Table 3 lists the resources and issues mentioned by the commentators and indicates the proportion of commentators addressing each resource or issue.

T A B L E 3  
Proportional Analysis of Scoping Comments

<u>Resource or Issue</u>	<u>Percent of Commentors* Addressing This Resource or Issue</u>
<u>Resources</u>	
Caribou	62.5
Peregrine Falcon	56.3
Fisheries	31.3
Waterbirds	25.0
Polar Bear	12.5
Grizzly Bear	12.5
Wolves	12.5
Dall Sheep	12.5
Moose	6.25
Musk Ox (potential habitat)	6.25
Fox	6.25
Wolverine	6.25
<u>Issues</u>	
Colville River (Wildlife Habitat and Scenic Value)	50.0
Subsistence Use of NPR-A Resources	43.8
Barrier Islands as Bird Habitat	31.3
Utukok Caribou Calving Grounds	25.0
Freshwater Wetland Habitats Essential to Bird Molting and Feeding	18.8
Habitat and Sites Needed for Wolves, Wolverine and Bear Maternal Denning	6.25

\* Percentages do not total 100.0 since many commentators addressed several resources or issues.

#### B. Identification of EIS Issues

After the EIS scoping process was completed but before an Environmental Impact Statement (EIS) was commenced the BLM used sound scientific methods and the best available data to apply three analytical tests to NPR-A values, features and areas. These analytical tests are the vulnerability, sensitivity and proven mitigation tests.

° The Vulnerability Test determines whether a significant proportion of a resource, feature or area is at risk of being impacted by oil and activities. For example, the Western Arctic Caribou Herd generally is broadly dispersed over hundreds of millions of acres. However, for a few weeks each spring most of the pregnant caribou from this herd congregate in a calving area in western NPR-A that best provides optimal habitat. Similarly, an area to the north and east of Teshekpuk Lake provides a unique habitat for molting geese. All of NPR-A's moose shelter in the riparian habitat of the Colville River and its tributaries in winter. These species and others that congregate for a part of each year in a restricted habitat are clearly vulnerable to impacts. Species which remain broadly distributed throughout the year, such as fox and ground squirrel, are not as vulnerable to impacts.

° The Sensitivity Test looks at how vulnerable species, features and areas respond to disturbance. Biologists have found that some wildlife and plant species are highly sensitive to human disturbance while other wildlife and plants may be unaffected by the presence of man's industrial activities and facilities.

° The Proven Mitigation Test looks at those practices known to effectively protect vulnerable and sensitive species from harm (practices which have been successfully applied in the past). These successful mitigations for protecting a species can tip the balance in favor of leasing its habitats.

The BLM used the vulnerability, sensitivity and mitigation tests as described in this EIS to identify those noteworthy resources, features and areas which are most at risk of being impacted. The BLM, consistent with CEQ guidance, made these noteworthy resources, features and areas the central focus of the Environmental Impact Statement (EIS) preparation process. This decision, which followed scoping (see Table 4), was documented April 30, 1982, in a formal Record of Decision from the BLM, State Director for Alaska (McVee, 1982).

#### C. Preparation of the Draft EIS

The NPR-A Draft EIS listed various leasing alternatives and had estimates of the impacts to the "central focus" resources, features and areas under the various alternatives. The Draft EIS was released to the public on October 1, 1982.

#### D. Analysis of Public Comments on the Final EIS

Comments were received between October 1 and December 23, 1982. The BLM reaction to these comments is described as a part of Chapter Six. Changes have been made throughout this EIS where necessary to respond to these comments and to reflect BLM's own reexamination of Draft EIS treatment of various resources and issues.

T A B L E 4  
Pre-DEIS Classification of Resources and Issues  
 (adapted from McVee, 1982)

<u>Values Considered</u>	<u>Values to be Given Detailed Impact and Mitigation Analysis</u>	<u>Values to be Given General Impact and Mitigation Analysis</u>	<u>Values Addressed in the Scoping Process Which Need Not Receive EIS Treatment</u>
Caribou	X	—	—
Grizzly Bear	X	—	—
Polar Bear	X	—	—
White-fronted Geese	X	—	—
Black Brant	X	—	—
Peregrine Falcon	X	—	—
Other Raptors	X	—	—
Wolves	—	X	—
Dall Sheep	—	X	—
Shorebirds	—	X	—
Ducks	—	X	—
Gulls, Terns and Jaegers	—	—	X
Moose	—	X	—
Wolverine	—	X	—
Fox	—	—	X
Musk Ox Habitat	—	—	X
Tundra Hare	—	—	X
Ptarmigan	—	—	X
Passerines	—	—	X
Loons	—	—	X
Whistling Swans	—	X	—
Threatened and Endangered Plants	—	—	X
Fisheries	—	X	—
Water Use and Availability	—	X	—
Gravel Use and Availability	—	X	—
Sociocultural and Subsistence Issues	X	—	—
Recreation	—	X	—
Wild Character	X	—	—
Values Along the Colville, Utukok and Etivluk-Nigu Rivers	X	—	—

E. Final EIS Treatment of Noteworthy Resources and Issues

The Draft EIS was consistently criticized for the poorly explained numerical classification system in Draft EIS Table I-2 and I-3 which was an attempt to determine the extent of EIS treatment of particular NPR-A resources and issues. Although BLM still believes this classification system has merit, it was deleted from this Final EIS which treats the following resources and issues in this manner:

1. High Risk Resources and Issues

The following resources and/or issues have been given comprehensive treatment in this Final EIS:

- Caribou
- Grizzly Bear
- Polar Bear
- White-fronted Geese
- Black Brant
- Peregrine Falcon
- Other Raptors
- Fisheries
- Sociocultural and Subsistence Issues
- Recreation and Primitiveness (combining concerns of: Recreation, Wild Character and Values along the Colville, Utukok and Etivluk-Nigu Rivers)

The BLM acknowledges that these resources and/or issues face the highest risk of potentially adverse impacts from activities resulting from implementation of an NPR-A leasing program. The Final EIS analysis for each of these resources and/or issues was specifically considered in the formulation of the Preferred Alternative (Plate One) and in model mitigative stipulations.

2. Moderate Risk Resources and Issues

The following resources and/or issues have been given a more general treatment in this Final EIS:

- Wolves
- Dall Sheep
- Shorebirds
- Ducks
- Gulls, Tern and Jaegers
- Moose
- Wolverine
- Fox (Arctic and Red)
- Loons
- Whistling Swans
- Environmental Quality Issues: Soils, Air and Water Quality (water/gravel use and availability)

These resources and/or issues can be protected from significant adverse impacts through BLM policy decisions or application of mitigative stipulations during the lease tract selection or permitting processes. They fall out of the high risk category after application of the proven mitigation test. The Final EIS limits treatment of these resources and/or issues to that needed to describe BLM's conservation measures.

### 3. Low Risk Resources and Issues

The following discussion concludes EIS treatment for these resources and/or issues:

- ° Musk Ox Habitat and Tundra Hare: There are no musk oxen or tundra hares resident on NPR-A, although musk oxen have been seen occasionally. In one instance of recent years a musk ox was killed on NPR-A when it wandered onto the Reserve from the Lisburne Peninsula. BLM as the land managing agency has no plans for reintroduction of musk ox or tundra hare. However, oil and gas activities are not expected to damage potential habitats sufficiently to preclude reintroduction at some future date.

- ° Ptarmigan and Passerines: Oil and gas activities on NPR-A are not expected to reach a level that would adversely affect NPR-A's populations of ptarmigan or passerine birds. These birds will be sufficiently protected in the BLM permitting process with its general natural resource conservation requirements.

- ° Threatened and Endangered Plants: Two plant species proposed for the endangered species list have been identified within NPR-A by Murray (1980). Mertensia drummondii and Salix ovalifolia var. glacialis are known to grow on sand dunes south of Barrow, and Mertensia was also discovered on sand dunes north of Umiat (Marianne See, BLM, Personal Communication).

Although not known to exist in NPR-A, two plant species, Erigeron Muirii and Montia bostockii, are proposed as threatened species. They have a high probability of occurring on dry slopes and on wet alpine sedge-grass-forb meadows or moist centers of frost scars (respectively) within the NPR-A boundaries.

Although none of these four species are officially listed as threatened or endangered, they are recognized under BLM policy (BLM Manual Section 68-40, I.M. AK 80-722, Change 1) which provides protection to proposed species equivalent to officially listed species. In addition, a 1979 amendment to the Endangered Species Act of 1973 provides partial protection to species formally proposed for listing. These four species were recognized as proposed in the Federal Register of December 15, 1980 Vol. 145, No. 242.

The following model mitigation measures taken during the permitting process should prevent adverse impacts to these plant species. All known population sites must be excluded from surface occupancy. Areas identified for surface impacting activities, such as off-road traffic or construction, will be searched for these species by a qualified botanist. This site examination should occur between July 7 and August 7 and should take place concurrently with archaeological site examination. Areas adjacent to known population sites will be closely examined. Those that have similar environmental conditions to known population sites, such as terrain characteristics, soil, and

companion plants, will be carefully examined and set aside as potential critical habitat or expansion habitat as required.

#### IV. OVERVIEW OF ALTERNATIVE LEASING STRATEGIES

In a "Record of Decision" following the scoping process (McVee, 1982), the BLM State Director for Alaska selected six alternatives for EIS analysis: standard requirements leasing, selective deletions, no surface occupancy leasing, design solution leasing, seasonal restriction leasing and deferral leasing. Subsequent to the State Director's scoping decision, it became apparent that the no surface occupancy approach was best applied at the permitting stage when the precise nature of the activity and the exact location where it would take place would be known. Therefore, "no surface occupancy" restrictions are no longer being considered as a major leasing strategy. The BLM will reserve the right to apply no surface occupancy restrictions during permitting. The BLM has analyzed the remaining five alternatives and has developed a Preferred Alternative (Plate One) by combining the various alternatives (that is deleting some land, deferring other lands and adopting special management practices as needed).

The following discussion offers a brief description of each alternative as well as its overall advantages and disadvantages.

##### A. Standard Requirements Leasing

This base case alternative would offer all of NPR-A for lease while selecting from appropriate restrictions in leasing and permitting actions which:

- ° Have been previously adopted by BLM for NPR-A leases;
- ° Are routinely applied in a permitting action by BLM's Fairbanks District Office;
- ° Are routinely employed throughout BLM; and/or
- ° Have been developed as "model" stipulations in this EIS process (see Chapter One, Section III. E.3.; and Chapter Three, Section III).

Representative "Standard Requirements" are listed on Figure 20 (Chapter Four). This alternative represents an analytical base case where development could occur anywhere within NPR-A and the "state-of-the-art" environmental protections applied on a permit-by-permit basis would govern development.

- ° Advantages: Both the petroleum industry and the Federal government have experience in meeting these requirements in the Outer Continental Shelf and in onshore leasing outside Alaska and within NPR-A (NPR-A Sales 821 and 822).
- ° Disadvantages: It assumes that the permitting process will be able to provide regional problem solutions through site-specific stipulations in many cases based on limited fish and wildlife resource information.

##### B. Deletion

BLM may administratively delete lands from a leasing program when the potential environmental losses from development of these sensitive areas presently

appear to outweigh the perceived oil and gas production benefits. However, administrative deletion is not synonymous with legislative withdrawal. Deletion could lead to a withdrawal by Congressional action if a future analysis indicates that the loss of surface values would always exceed the oil and gas benefits. Lands recommended for deletion by this EIS appear on Plate One at the back of the EIS.

As recommended in this Final EIS, lands under a deletion designation would be closed to leasing but, subject to the findings of specific NEPA compliance documentation, open to non-impacting geophysical exploration and consideration as routing alternatives for roads and pipelines.

Some lands recommended for administrative deletion in this Final EIS may eventually be found to be suitable for leasing and other multiple uses and restored to the leasing program. Before these lands could be offered for lease, the BLM would:

- ° Inform the public that lands previously deleted are being reconsidered for leasing and give the reasons for reconsideration;
- ° Summarize for the public the impact discussion from this Final EIS and any new material;
- ° Respond to public comments and concerns in a formal "Record of Decision;" and
- ° Select appropriate stipulations.
- ° Advantages: Offers the best protection possible to sensitive human and natural environments where the presently perceived risk of environmental loss outweighs the present analysis of oil and gas potential.
- ° Disadvantages: Excludes possible oil and gas discovery and production which may not be in the national interest.

### C. Design Solution Leasing

Comments received indicated that the Draft EIS was ineffective in explaining the Design Solution Alternative concept. It was said by the commentators that the Draft EIS expended too much effort on designing proposed stipulations and not enough effort explaining the use of the DSA as a guideline for regulators and Lessees in the conservation of NPR-A's resources and values. The use of the term "Limited Surface Occupancy" (LSO) was said to be confusing and poorly defined. Although this terminology has been changed in the Final EIS, portions of the LSO concept were retained.

#### 1. Design Solution Alternative (DSA)

As used in this Final EIS, the DSA concept requires permit applicants for activities anywhere on NPR-A to submit an environmentally sound design supported by appropriate studies and/or analyses supporting Permittee preferred facility sitings and operational procedures. It also requires the Permittee to accept the responsibility to alter, if necessary, any preferred design, structure, operation and/or activity shown to be ineffective in conserving fish and wildlife values. The DSA does not commit a Lessee to undertake



any study or analysis beyond that required for a timely permitting decision. The DSA will allow for better and more informed decisions on a permitting action by both the regulator and the Lessee.

The DSA could be considered as a formal statement of a methodology used by responsible members of the petroleum industry throughout Alaska. As a new concept, it requires all permit applicants to go beyond the submission of only best engineering and/or most economic designs to be altered only by the insistence of the regulatory agency (with the accompanying commitment of manpower and public funds which may be needed elsewhere). The DSA requires the Permittee to submit plans that have already been designed to produce the least disruption to NPR-A's environment. Producing an environmentally sound design may incur additional cost to the "normal" project design and permitting phases, but this cost would be recoverable many times over if the spectre of stopping work because of unforeseen significant impacts is reduced.

The DSA is an admission in part that regulatory agencies may not have all the answers required to conserve NPR-A's resources. It is a request for more cooperation from a potential Permittee, who always is more informed on a project's specifics than the regulator.

## 2. Special Management Zones (SMZ)

Plate One, the Preferred Alternative, shows areas of NPR-A where a special application of the DSA has been proposed. These areas labeled as Special Management Zones (SMZ) move the DSA from a concept applicable to all NPR-A permitting actions to specific stipulatory language.

All oil and gas operations proposed to take place within an SMZ must be specifically designed and managed to reduce the risk of adverse environmental impacts to acceptable levels. To accomplish this, the regulator and the permittee may be required to place limitations on the number, type and intensity of all uses of an SMZ. Within an SMZ, all proposed uses must demonstrate that they will minimize: all disturbances during the seasons of intense fish and wildlife use, any permanent changes in SMZ habitats, and, especially, all chronic or cumulative adverse effects.

While the BLM recognizes that each proposed SMZ may contain areas of low importance to fish and wildlife resources that are capable of supporting most uses with few adverse effects, these areas have not been specifically identified. The studies required under the SMZ will be designed to find these areas and to realistically analyze expected impacts. In a more general sense, most exploration activities, including test wells if properly stipulated to avoid seasons of high fish and wildlife use, would be permissible within an SMZ as long as the minor impacts expected never become cumulatively significant. In the development and production stages of any oil field underlying an SMZ, scattered multi-well production pads will be permissible with seasonal adjustments in allowable human activity levels. However, the base camps, processing facilities, airstrips, docks, haulroads and major pipelines of an operational field may have to be located in less sensitive environments where year-round activities would be tolerable. All roads and air traffic patterns may have to be seasonally adjusted.

The following model SMZ stipulation has been proposed for the NPR-A leasing program as a part of the Preferred Alternative:

### 3. Model Stipulation for SMZ

In order to receive authorization for any activity within an NPR-A Special Management Zone (SMZ), the Lessee must reasonably demonstrate to the regulatory agencies that:

- ° Original and/or analogous Lessee studies/analyses of the specific effects of the proposed activity with regard to the fish and wildlife resources actually present within the SMZ reasonably support a conclusion that all phases of the proposed activity will be conducted so as to have little or no adverse effects on key fish and wildlife resources or habitats; or

- ° Original Lessee studies/analyses and/or the literature reasonably support a conclusion that the proposed activity will be temporary with little or no permanent adverse effects on fish and wildlife use or habitats in the SMZ because: it will not be conducted during the period of intense fish and wildlife use; it will not permanently alter the habitat to preclude fish and wildlife use; and/or it will not be conducted in proximity to important fish and wildlife habitats or migration routes.

Authorization of any activity within an SMZ capable of significantly disturbing or displacing the seasonal diversity of waterbirds, caribou, grizzly bear and raptorial birds or other important fish and wildlife use, or permanently damaging or destroying their habitats for which the SMZ was established will be based on the Lessee's evaluation of the location, timing, intensity of activities and the density of facilities for the proposed operations with respect to the fish and wildlife habitats within the entire SMZ, as well as the estimated cumulative effects of other user activities within the SMZ.

- ° Advantages: The DSA provides for conservation of NPR-A surface resources, especially within a proposed SMZ, through the establishment of cooperative procedures between the Lessee and the regulatory agencies. It allows the BLM to meet its appropriate multiple land use objectives within NPR-A while providing a Lessee the opportunity to discover and produce petroleum resources in the Lessee's and Nation's interest.

- ° Disadvantages: The DSA formalizes a previously optional practice of most responsible members of the petroleum industry. It has been viewed by the petroleum industry as an unnecessary addition to current requirements.

### D. Seasonal Restriction Leasing

During certain critical times for NPR-A's fish and wildlife resources, all oil and gas related operations would be substantially reduced or eliminated in proximity to seasonally sensitive fish and wildlife uses and habitats.

- ° Advantages: The BLM and the petroleum industry have experience from NPR-A and other exploration programs with the application of seasonal restrictions or "closed windows." These stipulations have been effectively applied in the past to reduce overall impacts of exploration.

° Disadvantages: These requirements may be inappropriate during development and production phases of NPR-A's petroleum resources because of the economic burden of potential production slow-downs placed on a Lessee.

#### E. Deferral Leasing

BLM may administratively defer lands from a leasing program while allowing non-impacting geophysical exploration when either the benefits of continuing presently established research programs or the potential environmental losses from development appear to outweigh the perceived oil and gas potential. As proposed in this Final EIS, only one area (shown on Plate One in the back of this EIS) would be deferred. The Fish Creek area will not be offered for lease until the 1987 lease sale to allow the U.S. Fish and Wildlife Service time to complete ongoing ecological studies.

The Draft EIS proposed an area in southwestern NPR-A for deferral until 1992. Reanalysis of this proposal between the release of the Draft EIS and this Final EIS indicates that BLM would not be in any better decisionmaking position in 10 years than it is at present. The BLM has neither a firm research proposal nor funding to conduct studies capable of answering questions concerning compatibility of grizzly bear/caribou migration with oil and gas development during the ten-year-deferral period. Therefore, as shown on Plate One, this area has been moved into another conservation category.

° Advantages: Deferment of the Fish Creek area allows for the completion of ongoing ecological research of benefit to total NPR-A management.

° Disadvantages: Delays possible petroleum discoveries in a small portion of the NPR-A.

#### V. THE BLM DECISION PROCESS

BLM management decisions for the NPR-A will be made on several levels within the agency to accomplish BLM objectives and follow legal guidelines. Primary authority for leasing decisions for the NPR-A rests with the BLM State Director for Alaska. Decisions regarding on-the-ground activities (seismic lines, facility siting, etc.) are delegated to the BLM Fairbanks District Manager and the Arctic Resource Area Manager. All management decisions for the NPR-A must consider the analysis presented in this Final EIS.

The BLM decisionmaking process also involves the public and State, Federal and local government agencies, BLM professional staff, and/or technical information from knowledgeable researchers. BLM's decision process began for NPR-A in 1976 when the Reserve was transferred by the Congress from the Department of the Navy to the Department of the Interior. After Congress authorized NPR-A leasing in the Appropriations Act of 1981, an Environmental Assessment (EA) (USDI/BLM, 1981) was prepared by the BLM Alaska State Office for the State Director. Coordination with the public, North Slope Borough, State of Alaska, and other Federal agencies continued throughout the EA preparation. Based on the EA, the BLM State Director for Alaska selected the lease tracts, developed lease stipulations, resolved policy issues and implemented the first two competitive lease sales. Issues and values tentatively identified by the EA as meriting EIS analysis were later confirmed during the EIS Scoping Process.

This Final EIS analytical effort encapsulates the process of gathering public, government and agency information and focusing it on priority concerns that are capable of influencing a management decision. In a Record of Decision to be released 30 days after publication of this FEIS, the BLM State Director for Alaska will make major decisions regarding the future administration and management of the NPR-A. These decisions include: whether to lease, when and where to lease, and how best to manage development to assure reasonable protection of existing surface values and uses.

## CHAPTER TWO. AFFECTED RESOURCES AND USES

### I. INTRODUCTION

CEQ guidance (40 CFR 1510) states that the "environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration." This seemingly simple charge is extremely complex when applied to NPR-A oil and gas leasing decisions for the following reasons.

- ° NPR-A is not a single environment but rather a mosaic of human and natural environments; and,
- ° Specific areas to be affected may not be identified until applications for drilling permits are received.

#### A. The Mosaic of NPR-A Environments

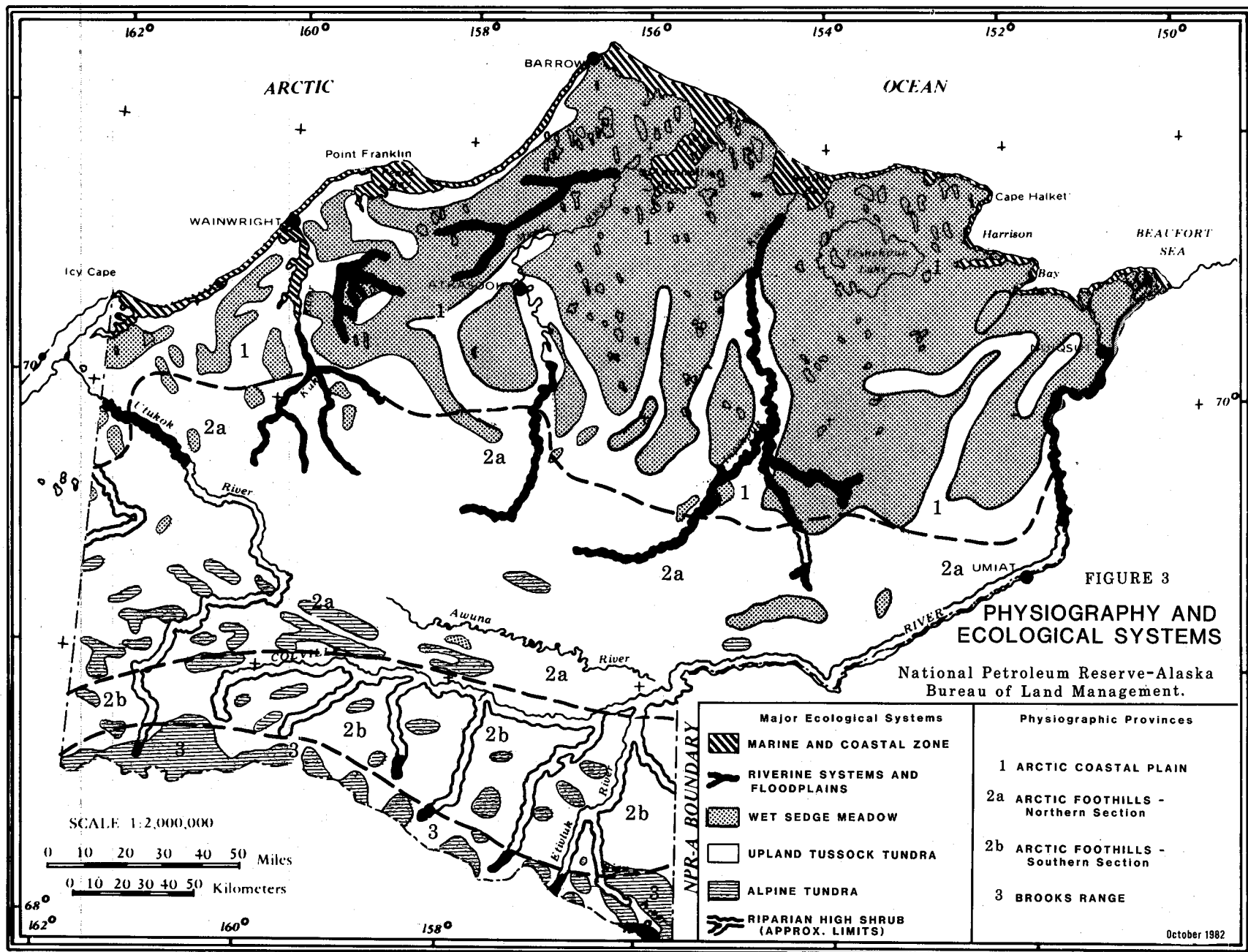
A number of parameters determine the type of environment. These include the latitude (how far north), the altitude (height above sea level), the distance from a seacoast, soil(s) types, whether the area is wet or dry (or varies from wet to dry) and the type and intensity of animal or human use. Such parameters, along with plant community(ies) determine the type of habitat. Based on these selected factors, NPR-A has been classified into the physiographic provinces and major ecological systems shown on Figure 3.

These physiographic provinces and ecological systems have been discussed in detail in a previous study of NPR-A entitled An Environmental Evaluation of Potential Development on the National Petroleum Reserve in Alaska (U.S. Geological Survey, 1979) and incorporated into this EIS by reference. Copies of this study are available by request from the BLM/ASO (912), 701 C Street, Box 13, Anchorage, AK 99513.

#### B. No One Knows Where the Specific Areas to Be Affected or Created Are

Not all of NPR-A's lands will ever be affected by oil and gas development. Figure 2 (Chapter One) shows areas of petroleum potential. However, no matter how much acreage is offered within the 23-million-acre (9.3-million-hectares) Reserve, it is predicted that:

- ° Less than four million acres will receive bids and be leased (only about twenty percent of the high potential oil and gas lands offered at the first two sales received bids);
- ° Exploration and production activities would affect only a portion of the leased lands; and
- ° Production facilities (development) may affect areas and resources of lands that were not leased by crossing them with roads and/or pipelines.



Source: USGS, 1979

## II. BIOLOGICAL RESOURCES

Information on the existing environment of biological resources which merit EIS comprehensive (high risk) or general (moderate risk) treatment (see Chapter One) is presented in this section. Unless otherwise cited, this material has been taken from the NPR-A 105(b) Study (USGS, 1979), the NPR-A 105(c) Study (USDI, NPR-A Task Force, 1979) and USDI, NPR-A Work Group 3 (1979). These documents are incorporated into this EIS by reference. Limited copies of these reports are available from BLM/ASO (912), 701 C Street, Box 13, Anchorage, AK 99513.

### A. Caribou

The following discussion is based partly on the proceedings of the BLM sponsored Caribou Discussion Panel held in Anchorage, Alaska, in May 1982, which considered the multitude of studies completed since construction of the Trans Alaska Pipeline System (TAPS) and the development of Prudhoe Bay and Kuparuk oil fields (Gilliam and Lent, 1982). This panel was able to identify several types of qualitative effects on caribou from various hypothetical examples of oil and gas exploration, development and production (including roads and pipelines) presented to the panel. A record of the panel proceedings (Gilliam and Lent, 1982) is available from BLM/ASO (912), 701 C Street, Box 13, Anchorage, AK 99513.

The three identifiable caribou populations on or adjacent to NPR-A that could be affected by future oil and gas developments are the Western Arctic Herd (WAH), the Teshekpuk Lake Herd (TLH) and the Central Arctic Herd (CAH) as shown in Figure 4.

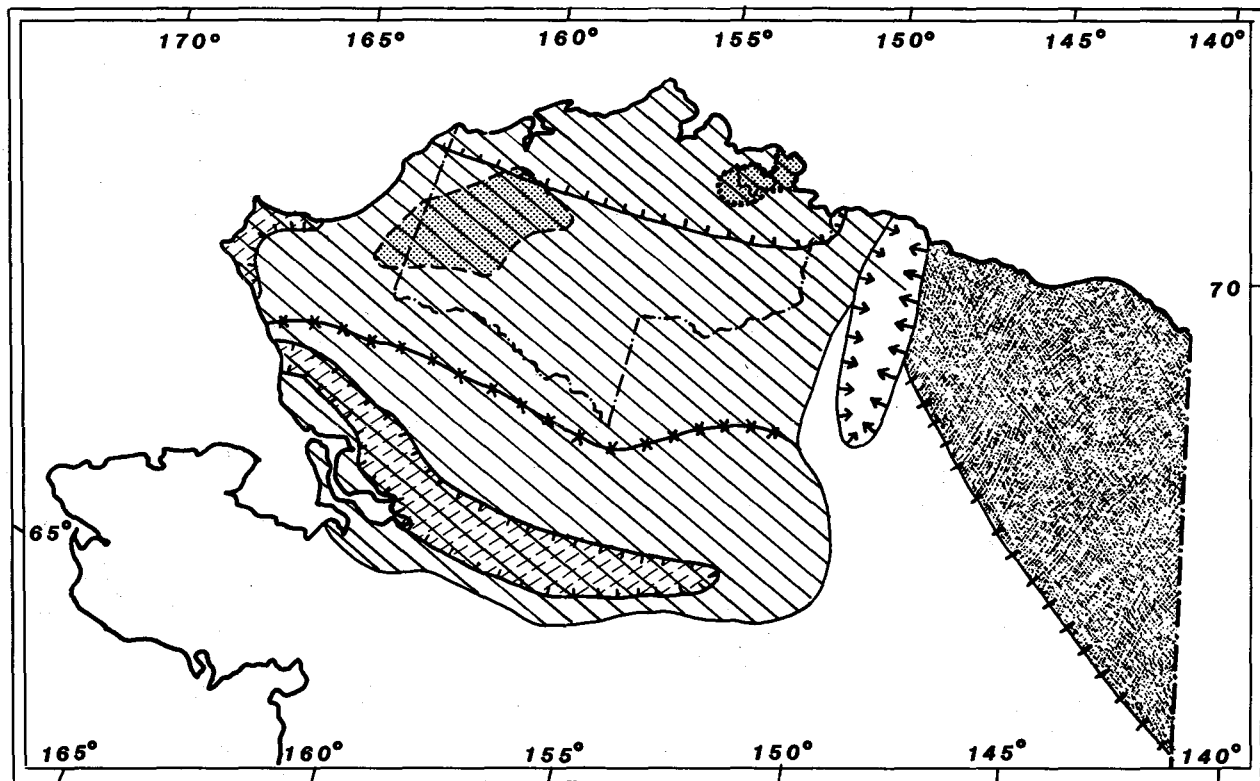
#### 1. Western Arctic Herd

Caribou of the Western Arctic Herd (WAH) use all of NPR-A. The Reserve comprises about 25 percent of the total area in northwestern Alaska occupied by the WAH within the past two decades. Nearly all of the calving zone, the major summer range, and a significant portion of the winter range lie within the NPR-A.

The WAH, Alaska's largest herd, has fluctuated dramatically in size. Lent (1966), based on the first aerial photo census, estimated the populations to be between 175,000 and 200,000 in 1962. Skoog (1968), based on reports of increasing harvests, thought the population might have been as high as 300,000 in 1964. Hemming (1972) estimated 242,000 in 1970. Davis et al. (1978) stated the herd had fallen to about 65,000 in 1976, and it is believed to be at about 180,000 in 1982. Various theories have been proposed to explain these fluctuations, but none are totally adequate. It is sufficient for the purposes of the EIS to recognize that these natural fluctuations occur.

Because all of the Reserve is used by the WAH in some years, designation of specific areas with precise boundaries for caribou is neither feasible nor particularly useful when trying to predict caribou use patterns for a particular year's cycle. However, to assess the significance of effects stemming from oil and gas development on the WAH, NPR-A can be divided into hypothetical zones according to the nature and timing of major caribou use during most years (USDI, NPR-A Task Force, 1978). As can be seen in Figure 5, the migratory use zone lies in the southernmost part of NPR-A. This zone is used

FIGURE 4



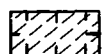
## RANGES OF ARCTIC CARIBOU HERDS



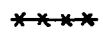
**NORMAL LIMITS OF DISTRIBUTION, WESTERN ARCTIC HERD**



**CALVING ZONE, WESTERN ARCTIC HERD**



**MAJOR WINTERING ZONES  
IN RECENT YEARS, WESTERN ARCTIC HERD**



**APPROXIMATE SOUTHERN BOUNDARY  
SUMMER DISTRIBUTION, WESTERN ARCTIC HERD**



**APPROXIMATE LIMITS OF DISTRIBUTION, CENTRAL ARCTIC HERD**



**APPROXIMATE WESTERN LIMIT OF PORCUPINE HERD**

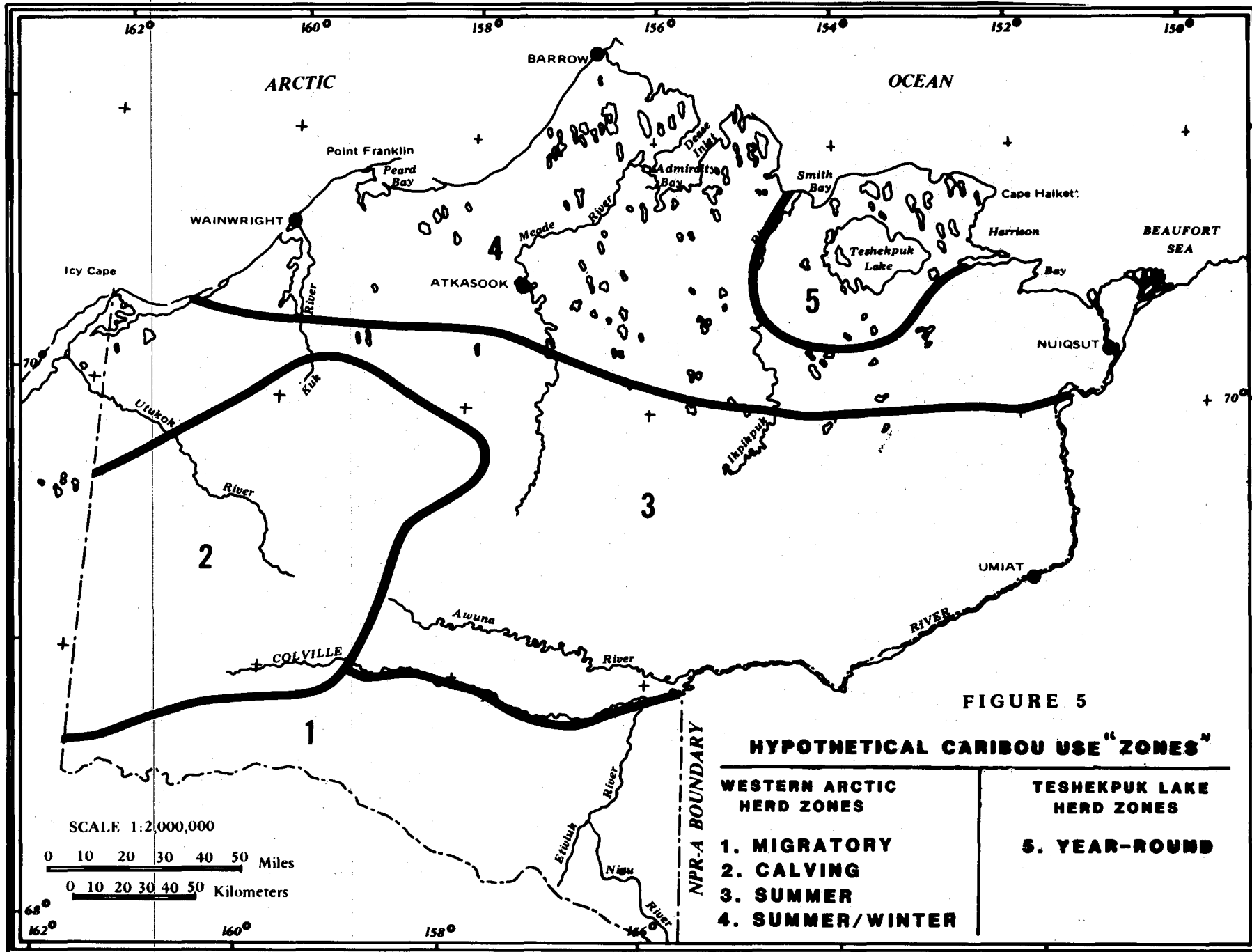


**CALVING AREAS AROUND TESHUKPUK LAKE, 1976-1978**



**NPR-A BOUNDARY**





Source: (NPR-A Task Force, 1978)

primarily by caribou moving in large groups along either an east-west or north-south axis, depending on the year and season. Pre-calving movements in spring may entail large numbers of caribou moving east-to-west through the zone or entering from the southern passes and moving westward.

Ninety percent or more of WAH calves are born from about May 24 to June 12. The calving zone designation is an attempt to map where the concentration of calving has been greatest during the two decades of observation. The calving zone shown will contain the greatest concentration of calving in most years, although in some years calving may occur outside this zone.

Following calving, by the first week of July most of the WAH is moving in large groups in a west-to-east pattern along both sides of the crest of the De Long Mountains in the migratory use zone. By about the second week of July, most of the caribou swing north into the summer use zone where they drift into small groups and remain until fall.

By August or September, caribou have crossed the Colville River and moved through this zone in a north-to-south pattern to return to the Noatak winter range. Other uses of the Colville drainage include a scattering of overwintering caribou, grazing by males and yearlings during the calving period, and summer range.

The coastal zone, used both in summer and winter, may contain 50 percent or more of the WAH during July and August. Distinct dispersed movement of animals to and from coastal areas occurs. Caribou are widely dispersed into small groups within this zone. When large numbers of caribou winter on the coast, the zone is important for pre-calving migration which proceeds mainly in a south or south-westerly orientation along generally undefined corridors. Winter use occurs in most years. Usually more than 10 percent of the WAH winters north of approximately 70° latitude. Summer occupancy of this zone includes occasional large dense concentrations of caribou seeking relief from insects by moving along the coast.

While different habitats are used seasonally, as indicated in the discussion of zones above, it is known that caribou utilize all of NPR-A. Dr. Peter C. Lent (USGS, 1979), a noted caribou expert, states:

...the large, highly mobile caribou populations of the Arctic regions must not be considered able to withstand impacts of development because of the vast land mass they occupy. On the contrary, they are able to obtain high numbers only by long energy-consuming movements to and from specific areas that provide optimum conditions at specific times. These areas vary from year to year. The pathways of movement represent highly vulnerable "life-lines" essential for their well-being. The situation is analogous to and has the potential for proceeding in a similar fashion as the situation with the large, mobile mammals of the African savanna. In many areas development and restrictions to movements have resulted in fragmented small, sedentary populations, which, lacking free access to areas previously used to satisfy annual requirements, have become less productive, subject to stress mortality, and unstable.

This statement stresses the need for caribou access to all of NPR-A in order to maintain their present population dynamics, and to allow the continuation

of present subsistence hunting patterns on a broadly distributed caribou population.

## 2. Teshekpuk Lake Herd

This herd of 4,000 to 5,000 caribou remains relatively distinct from the Western Arctic Herd. Short seasonal movements maintain the herd year-round in an area around Teshekpuk Lake extending southward into the northern Foothills (see Figure 5, zone of year-round occupancy).

This group's range seems to be more confined than that of the comparable Central Arctic Herd (CAH) whose history and trends prior to the intensive studies begun after the discovery of oil at Prudhoe Bay were also poorly understood. Indications are that a similar group of caribou with comparable movement patterns was present in the same area 40 to 50 years ago.

Post-calving routes and early summering areas are becoming more clearly defined for this herd as a result of BLM study (P. Reynolds, 1982). Cows with calves have been observed later in summer on the same areas used for calving. Fall movements apparently take some or most of the herd south of the Chipp River, at least for part of the winter. Other caribou have been observed wintering north of Teshekpuk Lake and to the immediate south and southwest, but apparently few drift to the east. Some of these wintering caribou may be associated with the WAH.

## 3. Central Arctic Herd

In many respects, the Central Arctic Herd (CAH) differs from other larger herds of barren ground caribou. It is a small population of year-round tundra inhabitants with a correspondingly small range. Animal movements among portions of the ranges are relatively short and lack the impetus of numbers characteristic of well-defined migrations. Consequently, many responses documented for other caribou herds are not necessarily applicable to the CAH, and observed CAH responses may not be applicable to other herds or situations. The CAH's population of approximately 6,000 caribou inhabits a correspondingly small range and does not exhibit long, well-defined migrations. The herd is constantly in contact with industrial activity on some portion of its range allowing the caribou an opportunity to gradually habituate to some human activities. While the herd has been displaced from portions of its preferred calving areas (Gilliam and Lent, 1982), it appears to be demographically normal in terms of calf production and yearly recruitment. Moreover, the herd appears to be growing in the proximity of oil development and the associated infrastructure within its range. This suggests a measure of accommodation to existing and past disturbances. Despite local displacement, suitable habitats apparently remain below carrying capacity for this non-migratory herd. Low rates of predation and hunting mortality also favor an increasing population (Banfield, Jakimchuk and Cameron, 1981).

## B. Geese

Four species of geese that regularly use NPR-A's Coastal Plain during the ice-free season are white-fronted geese, black brant, Canada geese and lesser snow geese. Other geese rarely sighted in NPR-A include Ross' geese and snow geese. Highest densities of geese are usually found within 20 miles (30 km) inland from the coast. Geese concentrate on the Teshekpuk Lake Goose Molting Area (TLGMA) in July and on salt marshes and coastal areas in late summer.

The following discussion of black brant and white-fronted geese is based on the proceedings of the BLM sponsored Waterbird Discussion Panel held in Anchorage, Alaska in May 1982 (Gilliam and Lent, 1982). This panel analyzed the relationships between hypothetical petroleum exploration, development and production actions and their predicted effects on geese and other waterbirds present on NPR-A each summer.

## 1. Black Brant

Estimates have been made that up to 20 percent of the total world population of black brant molt to the north and east of Teshekpuk Lake in the TLGMA. A large portion of the nonbreeding segment of black brant from the Yukon-Kuskokwim delta, Wrangell Island and the Siberian mainland, Alaska's North Slope and the MacKenzie and Anderson deltas in Canada molt here. This annual occurrence demonstrates the importance of the Teshekpuk Lake to their life cycle. Figure 6 shows the area of the highest density of molting brant. Over 85 percent of brant molting habitat is contained within this area. Brant, the only colony-nesting goose on NPR-A, prefer deep open lakes within these tracts for molting. The largest nesting colony on NPR-A at Island Lake consists of 100 pairs. These brant are dependent on vegetation for food in coastal areas from Cape Halkett to Drew Point for up to 30 days following molt.

Black brant follow the same spring migration and fall migration pathways along Alaska's west coast. The lagoon and barrier island system at Icy Cape and Peard Bay provide food and nesting areas for the migratory brant. These coastal migrants move south-westward along the Arctic Coastal Plain toward the Yukon River delta, Izembek Lagoon, and south-eastward along the Pacific Ocean coast to wintering areas in Puget Sound, Baja California and mainland Mexico.

Black brant are very vulnerable to human disturbance, especially during molting. Brant and other geese molt in remote traditional areas away from disturbances.

## 2. White-fronted Geese

The white-fronted goose is the most numerous and widely distributed species of goose on NPR-A. This species accounted for 59 to 97 percent of all geese observed from late June to mid-September during 1977 and from 71 to 94 percent of observations made from July to September 1978. Average population levels for 1977 and 1978 were 53,900 and 47,800 respectively. White-fronted geese generally enter the Reserve from the east and south in May dispersing to suitable habitat on the Coastal Plain. Observations indicate that areas of the central Meade River east of the Ikpiuk River are critical to spring migrants. Their departure from the Reserve is by scattered routes to the east and south leading to the main central flyway.

White-fronted geese are more broadly distributed over NPR-A than are black brant. For example, only about 5,000 molting white-fronts are typically in the TLGMA each July.

During the molt, flock size of white-fronted geese on NPR-A is relatively small compared to other species of geese. Flocks do not shift to coastal areas following completion of the flight feather molt. White-fronted geese are known to segregate themselves from other flocks during molting periods and feed on different foods in different microhabitats.



White-fronted geese are the most common breeding geese on NPR-A but are not colony nesters. They nest early in the season on upland sites or polygonal ridges near wetlands containing Carex and Arctophila near deep open lakes, flooded tundra and beaded streams. Beaded streams appear to be important transportation routes for flightless young and adult white-fronts.

#### C. Peregrine Falcon and Other Raptors

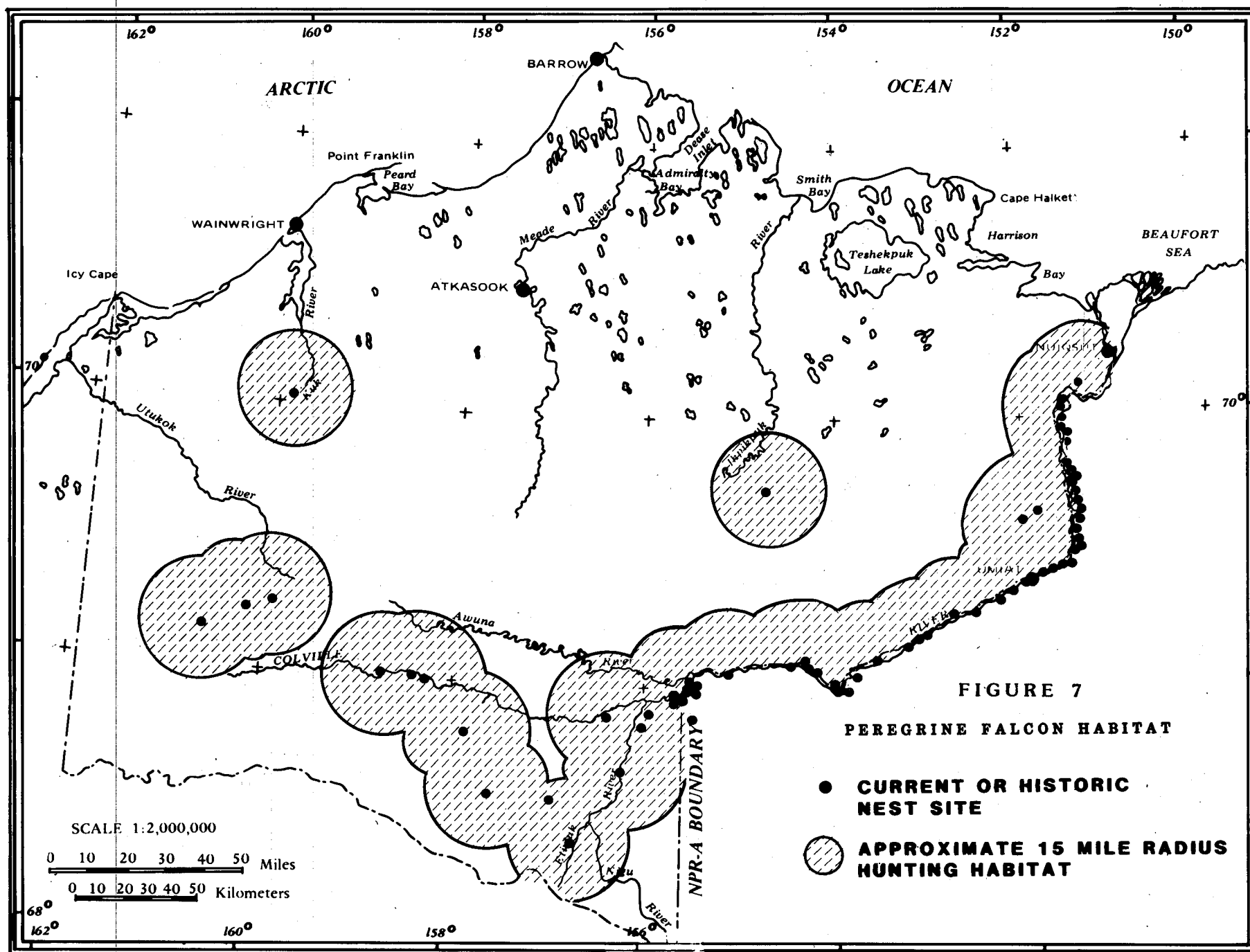
Of the three subspecies of peregrine falcons in Alaska, the endangered Arctic peregrine falcon (Falco peregrinus tundrius) has prime nesting habitat within NPR-A. The Colville River and its main tributaries are recognized as the main nesting habitat for the endangered Arctic peregrine in North America. Figure 7 shows most of the nest sites along the Colville drainage as well as some other known sites in NPR-A. Fifteen-mile-radius circles have been drawn from each nest to illustrate the suspected extent of hunting habitat.

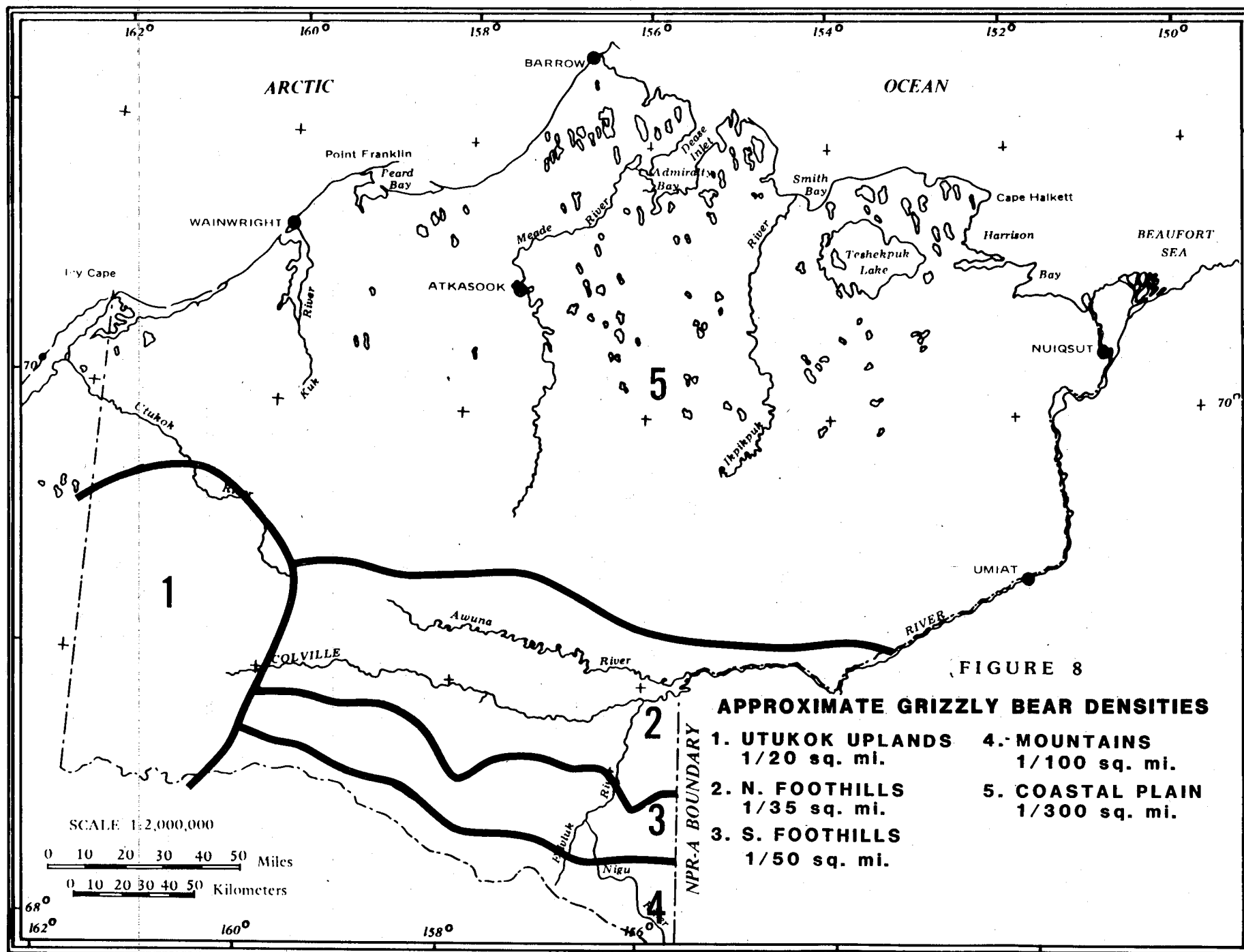
Peregrine falcons nest on cliffs, bluffs, rocky outcrops and at the base of rocky faces above talus slopes. Since they are known to return to historic nest sites after years of disuse, all potential nests sites are important. Current and historic nesting sites are documented for the Awuna, Colville, Etivluk, Ikpiuk, Kuk and Utukok Rivers. Of the 67 current or historic nest sites, ninety-one percent are on lands withdrawn from leasing due to the Wild and Scenic River Study of the Colville, Utukok and Etivluk/Nigu Rivers. Lands within two miles (3.2 km) of the Colville, Etivluk/Nigu and Utukok Rivers are currently withdrawn from leasing by the ANILCA to provide time to determine whether these rivers merit permanent designation as wild and scenic (see Figure 14).

Five other species of resident or migratory raptors, in addition to the peregrine falcon, are present on NPR-A: golden eagles nest in the Brooks Range and Foothills of NPR-A; gyrfalcons nest on cliffs along river courses; rough-legged hawks also nest on cliffs along river courses and at some off-river sites; and snowy owls and short-eared owls nest on the open tundra, primarily on the Coastal Plain. Annual raptor populations in NPR-A vary due to fluctuations in prey populations which affect raptor nesting locations and productivity. None of these other raptor species is endangered in Alaska.

#### D. Grizzly Bear

The grizzly bear population on NPR-A is estimated to be between 400-450 animals. They feed in the river valleys out to the Coastal Plain from spring through the fall. The grizzly bear population in southwest NPR-A appears to be more productive than that of the eastern Arctic slope grizzly bear, possibly because of the proximity to caribou calving grounds. The added protein available from dead caribou found on the calving grounds and occasional calves killed by bears improves bear survival and reproductive success. Grizzly densities on and adjacent to the calving area are well above average grizzly density for the remainder of NPR-A (Figure 8).





Source: (NPR-A Task Force, 1978)



#### E. Polar Bear

Use of terrestrial habitats by polar bear within NPR-A is limited to coastal regions from October through April when females seek maternity denning habitat. Prime onland denning areas are determined by the location of suitable snow drifts within a zone extending up to 20 miles (30 km) inland from the coast. Figure 9 shows areas in NPR-A that appear to have the necessary habitat requirements for onland denning. However, most maternity dens are offshore on the winter pack ice.

#### F. Dall Sheep

Approximately 400 Dall sheep are believed to be resident in the De Long Mountains which form the southern boundary of NPR-A (Figure 10). Most sheep are found near the crest of the De Long Mountains, and it is likely that there is a high degree of interchange and movement across the divide into the Noatak drainage.

Dall sheep seek areas of limited snow accumulation, adequate vegetation and good escape terrain. The areas that generally meet these conditions are the south-facing alpine slopes in the Noatak River drainage south of NPR-A.

#### G. Wolf

Population densities and numbers of wolves in NPR-A are generally low but vary from between one per 60 square miles (90 sq km) to one per 200 square miles (300 sq km). Higher densities occur in the foothills and mountains of the southeastern part of NPR-A (Figure 11). By way of comparison, wolf densities on the south side of the Brooks Range average about one per 75 square miles (105 sq km). Wolves depend primarily on caribou, moose, and Dall sheep for food throughout the year.

#### H. Moose

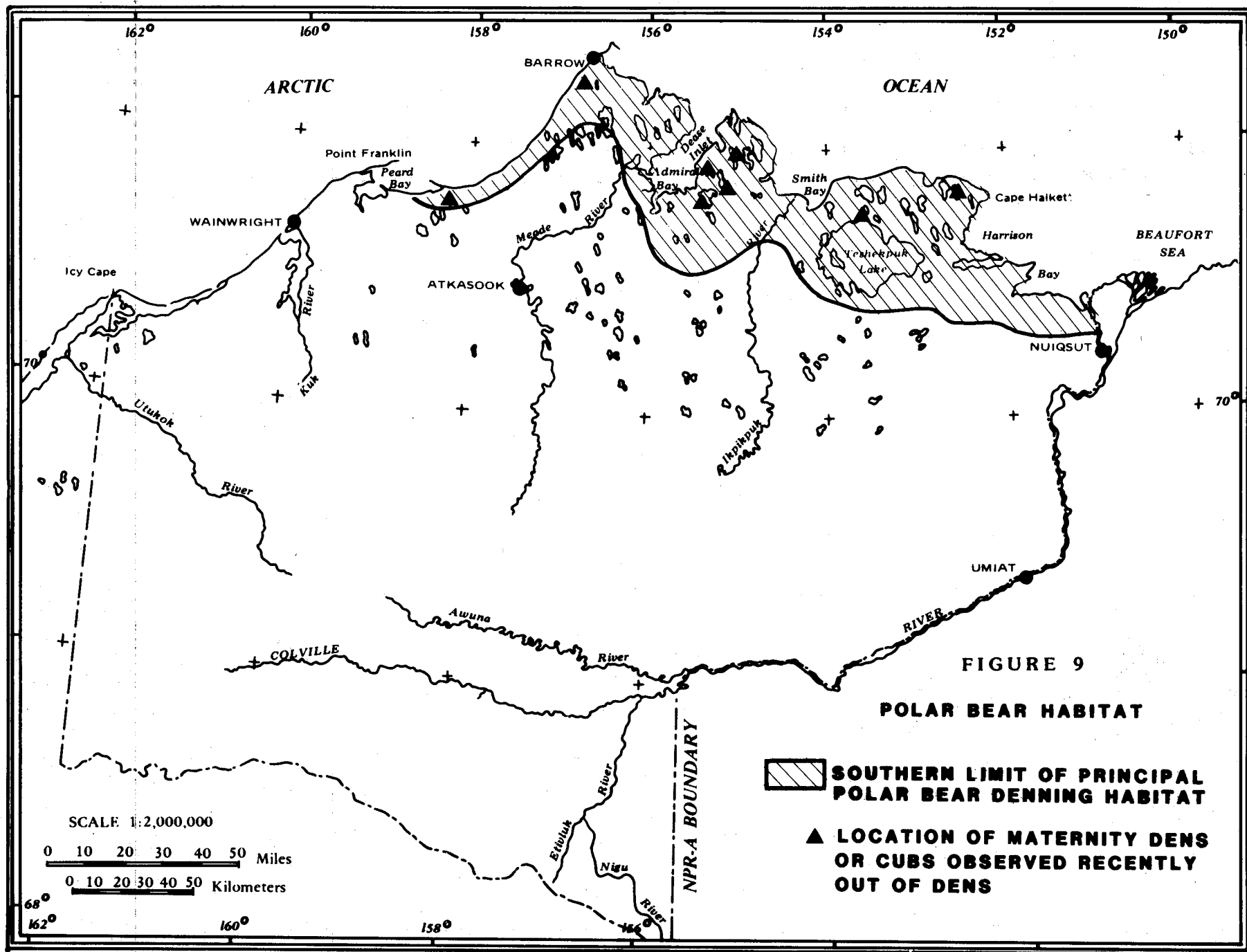
There are about 1,200 moose in the Colville River drainage. Of these, 85 percent are located on the Colville River floodplain and its tributaries between the Oolamagavik and Anaktuvuk Rivers with a few observed on the Colville River floodplain above the mouth of the Etivluk River. The highest moose density is in riparian shrub habitat.

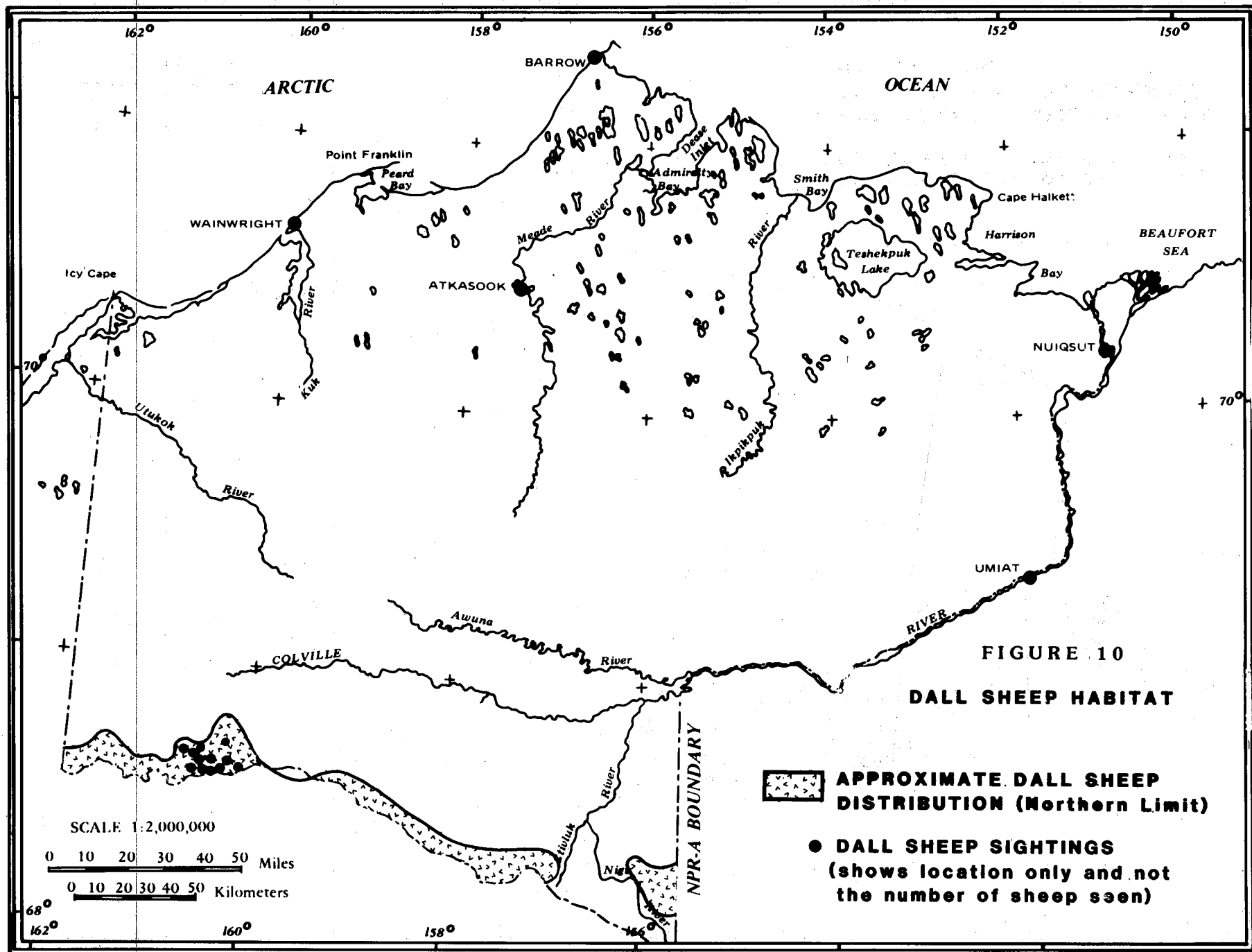
Very few moose range north of the Colville River in winter. The only repeated sightings have been made on the upper Ikpikpuk River.

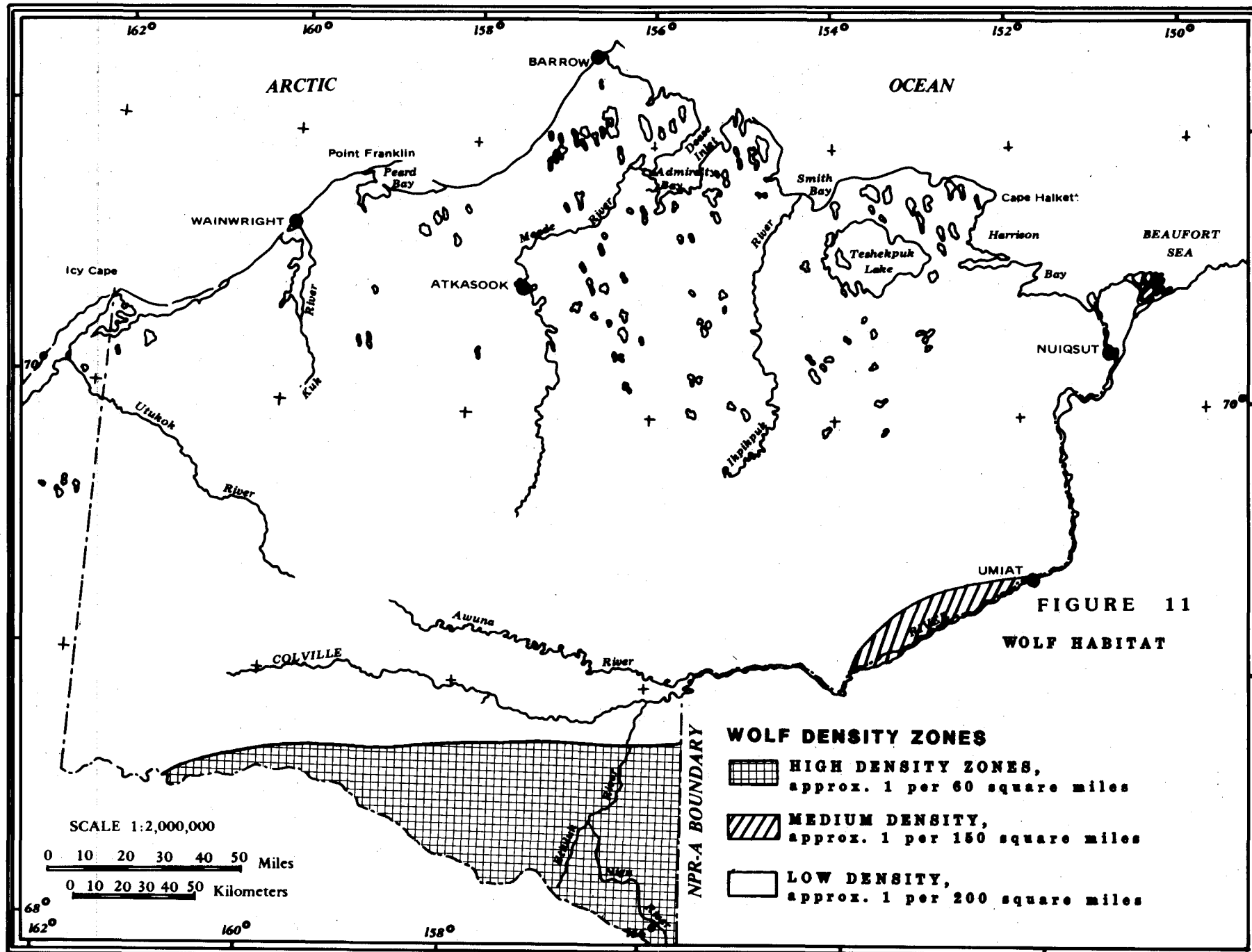
In summer, a few moose scatter over the Coastal Plain and the Foothills in the Kokolik and Utukok drainages. Moose densities in the Colville flood plain are apparently somewhat reduced during summer and into early winter because of dispersal along smaller streams of the drainage system.

#### I. Wolverine

Wolverine density on the Arctic Slope is usually considered low in comparison to that of other areas of Alaska. However, a relatively large number of wolverines and their tracks were observed in portions of NPR-A during 1977 and







Source: (NPR-A Task Force, 1978)

1978, notably along the Colville River and on the upper Utukok River. While wolverines occur throughout NPR-A, most sightings and observations have been in the Foothills.

#### J. Ducks

Ducks populating NPR-A during the ice-free season include both dabbling and diving ducks. The following species of dabbling ducks have been reported: pintails, mallard, green-winged teal, baldpate, and shoveler. The diving ducks consist of oldsquaw, Steller's eider, king eider, common eider, red-breasted merganser, scaup and scoter. Another 20 species of ducks are sighted less frequently within the NPR-A.

The greatest densities of dabbling ducks are within 30 miles (48 km) of the Arctic coast. Pintails made up 89 percent of all dabbling ducks observed during aerial surveys in 1977 and 85 percent in 1978. Diving ducks attain highest densities within 30 miles of the coast between Peard Bay and Smith Bay and as far as 10 miles (16 km) inland from Wainwright to Icy Cape. Oldsquaw comprised 83 percent of all diving ducks observed during aerial surveys in 1977 and 60 percent in 1978. The Teshekpuk Lake Goose Molting Area contains important habitat for both groups of ducks.

#### K. Shorebirds

Approximately 21 species of shorebirds regularly use the NPR-A. The most numerous species recorded at three intensive study sites in NPR-A were pectoral sandpiper, red phalarope, dunlin, northern phalarope, and semipalmated sandpiper.

The highest densities of breeding shorebirds in NPR-A are within about 20 miles (32 km) of the coastline. Breeding populations exhibit relatively even distribution in this zone. Wetlands around river delta systems are extremely productive areas. However, godwits and whimbrels are more common in tussock tundra areas of the Foothills than elsewhere.

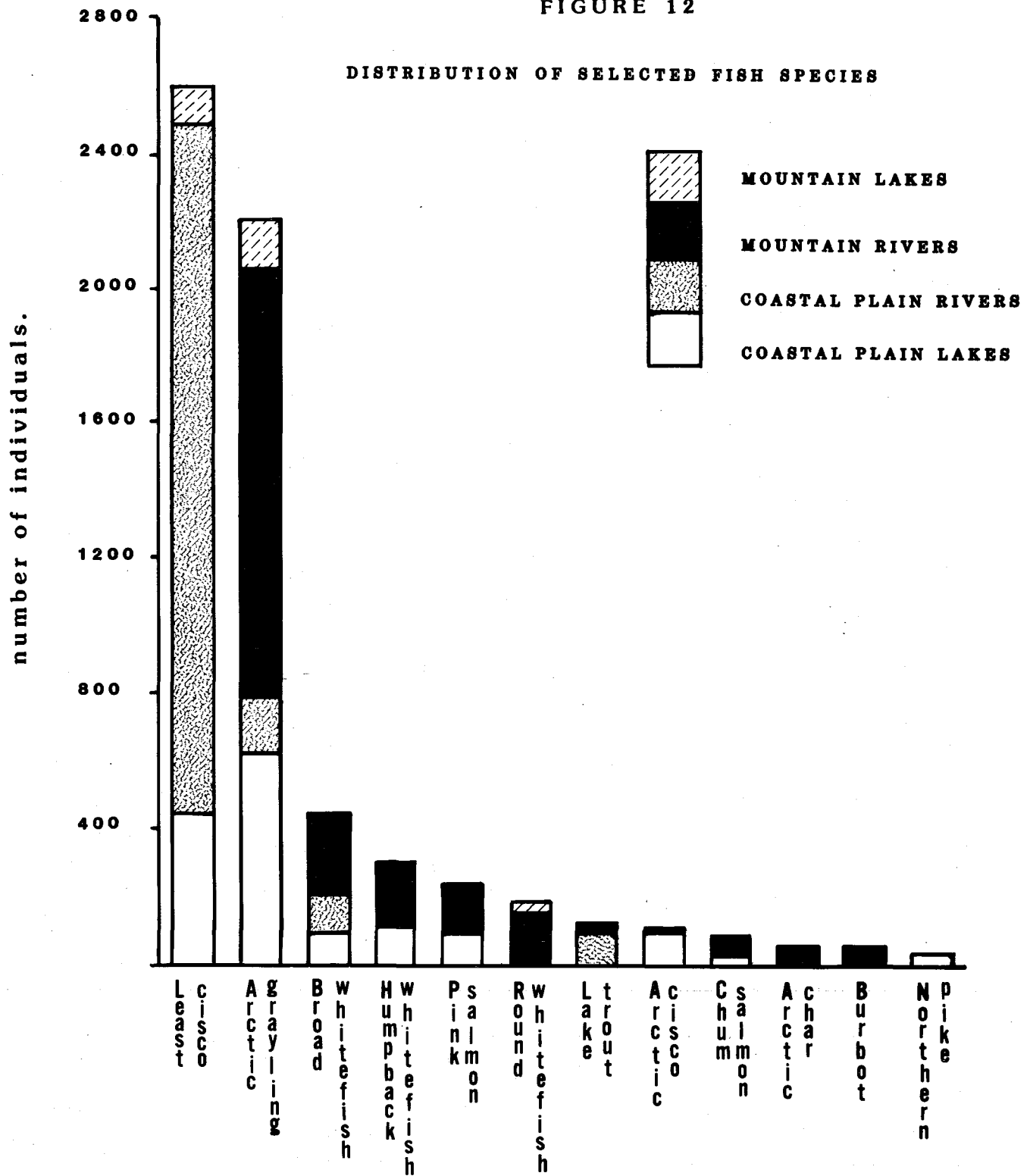
During August and September, portions of the coastal shoreline and adjacent lagoons and salt marshes are extremely important to phalaropes and other shorebirds staging for migration. In late July and early August large lakes in the Teshekpuk Lake area also support flocks of thousands of phalaropes.

#### L. Fisheries

The aquatic communities of NPR-A are both extensive and varied. The distribution and abundance of aquatic organisms and fish change seasonally. Ice on lakes and streams severely reduces the availability of overwintering fish habitat and may be the critical natural factor determining fishery distribution and carrying capacity. An overview of fish distribution by aquatic environment is shown in Figure 12.

The nearshore marine and coastal zone is believed to harbor 56 marine and 13 anadromous fish species. These include Arctic char, Arctic cisco, fourhorn sculpin, Arctic cod and Arctic and starry flounder. Seasonal abundance of fish along the coast is related to anadromous fish migrations to and from

FIGURE 12



Graph showing number of Individuals from selected fish species captured in NPR-A during the open water season, 1977-1978.

Source: (Hablett, 1979)

spawning locations, their feeding areas, and overwintering sites. Some freshwater fish not considered to be anadromous may occasionally enter brackish waters and estuaries.

The Arctic Coastal Plain of NPR-A encompasses the greatest proportion of freshwater surface area in NPR-A. Lakes range in size from the 201,510 acres (81,550 hectares) of Teshekpuk Lake to small potholes. Lakes in the western half of the Coastal Plain are mostly thaw lakes which are too shallow to offer critical overwintering habitat for resident fish. The deeper lakes that are more prevalent in the eastern half of the Coastal Plain are most likely to contain resident fish populations if they have inlets or outlets, adequate depth for overwintering, and suitable substrates, such as gravel utilized during spawning. Rivers originating on the Coastal Plain are mostly shallow runoff channels that may become intermittent during the summer. They serve primarily as fish migration corridors, but some, such as the Inaru River on the western Coastal Plain, also may provide limited spawning and overwintering habitat.

The Colville River, which flows east-northeast, intercepts most of NPR-A's Brooks Range drainage system. As a prime fisheries habitat, it provides spawning, overwintering, rearing, feeding and migrating opportunities to a large number of fish species. The Colville River delta's estuarine environment is also prime habitat for most freshwater and anadromous species found on NPR-A, as well as several other species. The hydrological and physical characteristics of the Utukok and Kokolik Rivers are similar to those of the Colville River, although on a smaller scale.

The Kuk, Meade, Topagoruk, Chipp, and Ikpiuk Rivers originate in the northern Foothills and descend from them across the Coastal Plain and flow north to the Arctic Ocean. Flows in these rivers are often intermittent in summer. Although few overwintering or spawning sites have been identified on these rivers, they provide essential migration corridors from the Arctic Ocean to inland lakes and headwaters.

Any water known to be or subsequently proved to be spawning, rearing, feeding, or overwintering habitat or a migration pathway in support of a subsistence fishery is considered to be extremely important. The areas shown as "Major Subsistence Fishery Areas" on Plate One are essential to the continuation of the subsistence lifestyle.

### III. HUMAN USE OF THE ARCTIC

Native peoples have occupied the North Slope area of northernmost Alaska, which includes the NPR-A, for at least 8,000 years. This remote, treeless, mostly frozen land, comprised of highly fragile terrain and delicate ecological balances is a place where human survival was possible only by the development of a highly sophisticated culture. Consequently, respect for the environment and its resources became the centerpiece of this remarkable culture.

Many of today's North Slope Natives, the Eskimos, or Inupiat (meaning "Real People"), are attempting to continue this traditional way of life. At the same time, new pressures and challenges brought on by such modern technological developments as oil and gas development have led them to adopt a new lifestyle fusing subsistence harvesting with "modern" technologies.

### A. History of Settlement Patterns and Population in the Arctic

The North Slope Inupiat did not come into significant contact with Caucasians until the early 19th century. Captain F.W. Beechey of the H.M.S. Blossom explored Alaska's northern coast in 1826 naming Point Barrow and Wainwright, sites within what was to become the NPR-A. By the end of the 1850's, whaling ships were regular visitors to the northern coastal waters. With them came the introduction of firearms, alcohol, and epidemic diseases, all of which changed traditional Native life forever.

As foreign whaling continued through the later 1800's, Inupiat were hired as temporary crew members and guides. Thus began a mixing of wage and Native subsistence economic systems that continues today. Continued contact with foreign whalers and later trappers, missionaries, and government officials through the early 1900's began changing the Inupiat in other ways. Their historic patterns of migratory hunting and living in temporary seasonal camps to harvest local resources were slowly modified.

Seasonal mobility was increasingly traded for year-round settlements near such newly established trading posts and missions as the coastal villages of Wainwright and Barrow. By the 1950's most of the inland Inupiat had moved for purposes of education to these coastal settlements or to Anaktuvuk Pass, which is located outside the NPR-A.

Many Inupiat remembered and yearned for a return to the traditional lifestyle. As a result, in the early 1970's two villages within the NRP-A, Atqasuk and Nuiqsut, were reestablished. Table 5 shows that the 1980 Native and non-Native populations for NPR-A villages were:

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T A B L E 5  
Composition of NPR-A Village Population

	<u>Alaska Native</u>	<u>Non-Native</u>	<u>Total</u>
Barrow	1,677	608	2,285
Wainwright	341	33	374
Atqasuk	88	13	101
Nuiqsut	183	33	216
Totals	2,289	687	2,976

Source: Alaska Consultants, Inc., 1981

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#### 1. The Mixed Subsistence/Cash Lifestyle

Public Law 96-487, enacted December 2, 1980, defines subsistence uses as:

...the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; and for customary trade.



Along coastal and offshore areas of the NPR-A these activities include fishing; collecting of invertebrates, eggs, roots, berries, and other natural resources; and hunting and/or trapping of caribou, polar bears, seals, whales, walrus, birds, and small mammals. Inland additional subsistence activities include the hunting/trapping/collecting of moose, grizzly bears, sheep, and other plants and animals of the tundra.

a. Current Subsistence Uses Within the NPR-A

Sociocultural research indicates that current subsistence uses within the NPR-A continue to be important to the Inupiat. This includes not only residents of the four NPR-A villages but inhabitants of other Arctic Native settlements who benefit from NPR-A subsistence harvesting. Natives who do not live on the Reserve receive subsistence resources from customary trade, and the harvesting of subsistence resources contributes to the maintenance of cultural identity.

Today subsistence gathering employs such "modern" technologies as snowmobiles, all-terrain vehicles and rifles. Traditional whale hunting also has been modernized by the use of boat motors, radio transmitters, and the use of shoulder guns that fire explosive darts (Worl, 1980).

1) Nutritional/Economic Benefits

Many Inupiat, particularly older ones, continue to prefer such traditional foods as caribou, whale, seal and certain types of birds, fish and wild plants. While many processed foods are stocked by Inupiat village stores, their resupply can be hampered by transportation problems particularly during the long winters. Prices are relatively high. For example, in Barrow, Alaska in January 1982 bacon was over \$4 per pound, fresh milk was \$6 a gallon, carrots were \$2.24 per pound, and bananas were \$1.29 per pound (Robert E. King, BLM, unpublished field notes). A 1980 study showed that 65 of 461 Inupiat households surveyed in northern Alaska reported under \$10,000 annual income, with the average household containing about 4.7 people (Alaska Consultants, Inc., 1981). Hunting, fishing, and gathering appear to be essential for these lower income households.

2) Sociocultural Benefits

Traditional activities related to subsistence uses still serve significant social functions in helping bind Inupiat communities together and providing cultural solidarity, status, and identity to individuals. Wild resources obtained by hunting, fishing, and gathering in the NPR-A continue to be shared and exchanged among families and villages. For example, certain Inupiat in Barrow trade various foodstuffs, including whale and caribou obtained in their area, with Inupiat of Kaktovik, Point Hope, and other North Slope villages. Today trading often is conducted via commercial airflights between villages, another example of modern technology used to accomplish centuries-old behavioral patterns.

A study published in 1970 noted that "...most adult Eskimos in North America are members of at least one trading partnership, and many are involved in several" (Burch, 1970). A Native of Kaktovik located 180 miles east of the NPR-A is a member of at least five governmental advisory groups on fish and

game management and Inupiat subsistence needs (Robert E. King, BLM, unpublished field notes, 1982). This requires his frequent attendance at meetings in Anchorage, Nome, and elsewhere. This "Eskimo bureaucrat" trades with Barrow and Point Hope relatives for "muktuk," whale skin, which is a traditional Inupiat delicacy. In turn he shares muktuk by air parcel with a sister in Iowa and other relatives in Canada.

Recent surveys of community values among North Slope villages indicate that subsistence activities are regarded not only as very important components of community and cultural life, but also key reasons for continuing to reside in the harsh environment of northern Alaska. Inupiat participation in subsistence activities has remained remarkably stable over time (Kruse, 1981). Living a more traditional lifestyle of hunting, fishing, and gathering is still highly valued by many Inupiat.

#### b. The Cash Economy

Inupiat participation in the wage economy has been increasing apparently as a direct or indirect (tax revenues) result of Arctic oil development. By 1980, the average cash income per Native household within the four NPR-A villages was between \$20,000 and \$30,000 (Alaska Consultants, Inc., 1981).

Money earned in the cash economy frequently is channeled back into the subsistence activities to buy equipment necessary for hunting. This includes the purchase of rifles, shotguns, ammunition, snow machines, boats, sleds, gas, and various items necessary for whaling.

#### c. Inupiat Perceptions of Desired Land Uses and Needs

The western concept of private individual ownership of land is a "new" idea for the Inupiat. While certain group territorial boundaries were generally mutually recognized and even defended vigorously at times (Burch, 1980), the land and its wild resources were viewed as available for use by all. Man was seen as part of nature, with an obligation (ritually expressed at times) to respect and live in harmony with the land and its resources. The frequently precarious existence of the Arctic environment led the Inupiat to develop a spiritual relationship to their natural environment.

One Inupiat described this spiritual relationship as a "community... united spiritually and physically to make it possible to survive in the Arctic. They were and they recognized they were a tribal people who had a common bond." (NPR-A staff notes, Barrow Public Meeting, 1981). The speaker noted "drastic changes" in this sense of community during the past 20 years.

Another Inupiat attempted to discuss the Native feeling for the land in terms an outsider might comprehend:

What if we Inupiat entered into the lands of another race and presented them with plans and regulations for drilling in their gardens. I feel that if we Inupiat did that we would probably be put in jail.... The Inupiat people are going through hard times. We Inupiat have no gardens. When (the Trans-Alaska) pipeline went through it disturbed the caribou. I am very concerned about the caribou--they are our garden.... We also

know where to look in our garden for the things we need. We must go inland for the caribou and to sea for the seals. It is harder for us to reach our gardens. Your gardens are more accessible. While we were inland my husband encountered a white man and he told us that we couldn't hunt in that area. Two other whites with guns also told us that we couldn't hunt there... my uncle is over 60 years old and this is his lifestyle. Yet whites with guns told them that they couldn't live that lifestyle. We were frightened and left. This happens because of white man coming in here with regulations for our gardens...." (NPR-A staff notes, Barrow Public Meeting, 1981).

A concern frequently expressed by Inupiat is that oil and gas development should be conducted with great caution and sensitivity for local resources and Native land uses and needs. One Inupiat stated that while he realized the villages can't go without oil and gas for fuel, he wished development to be done cautiously with care given to all resources (notes of Nuiqsut Public Meeting, June 1982).

Other Inupiat have spoken of potential dangers to subsistence activities from future oil and gas spills, dumping of sewage and other pollution, noise and development activities scaring away animals and fish, or need for buffer zones to protect sensitive habitats, and the problem of their prime subsistence areas and sacred sites being made known to non-Natives who might disturb them.

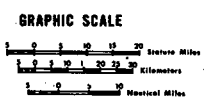
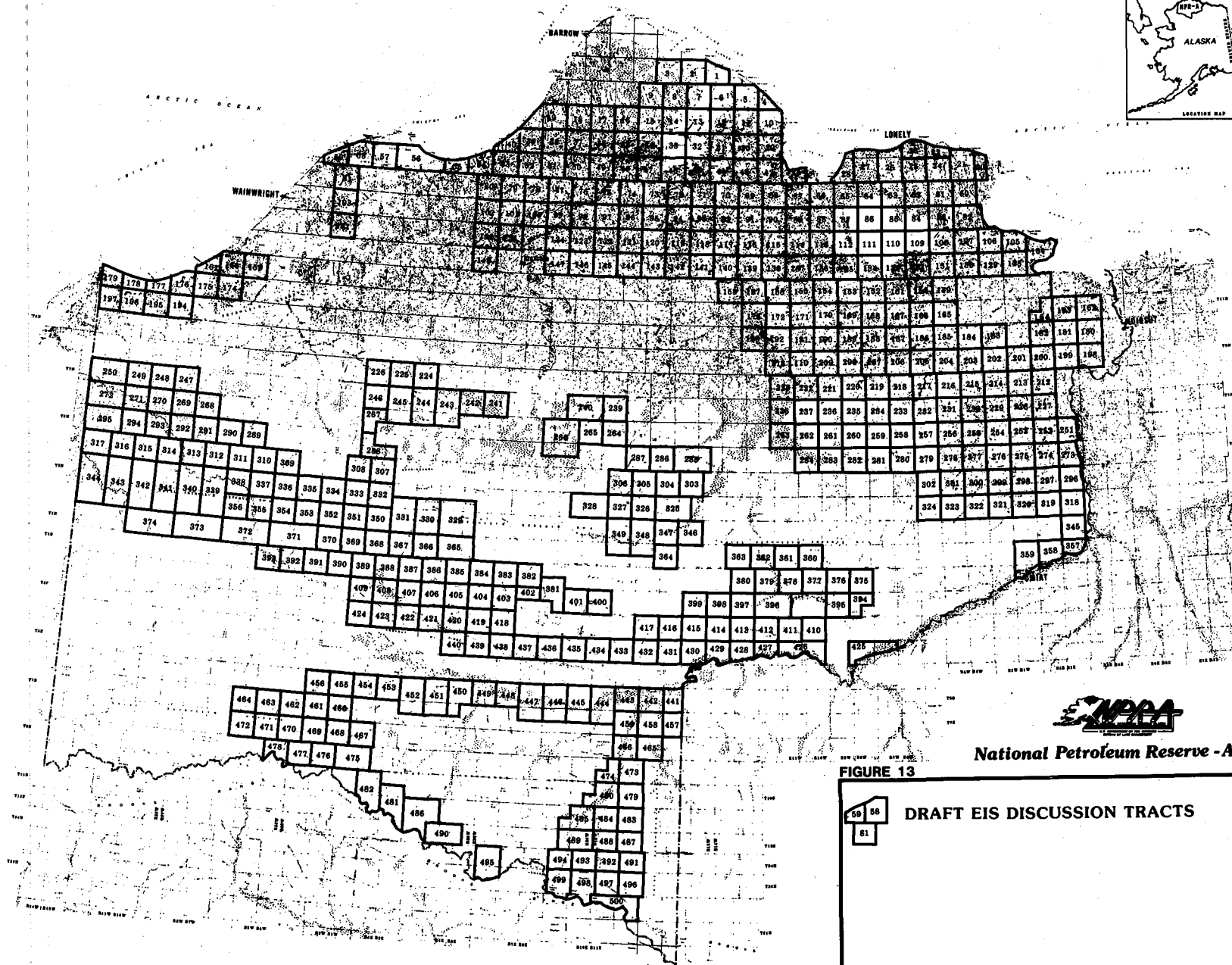
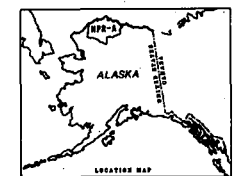
One indicator of important subsistence harvesting locations as an existing and desired land use is the distribution of Native allotments. Native allotments frequently represent areas of subsistence use over several generations. Tracts with allotment filings are shown in Table 6 (refer to tract designations on Figure 13).

Other sources of information on areas of great subsistence value include prior independent ethnographic research, the Federally funded 105(b) and 105(c) Studies, information on Traditional Land Use Sites compiled and updated by the North Slope Borough and content analysis of testimony and statements made by Inupiat elders, hunters and leaders. Based on these data, the Draft EIS discussion tracts (Figure 13) were sorted according to categories of subsistence value. A map showing these subsistence value ratings for Figure 13 is available from the Fairbanks District Office, Bureau of Land Management, North Post Ft. Wainwright, P.O. Box 1150, Fairbanks, AK 99707.

## B. Cultural Resources

Although only an estimated two to three percent of the 23 million acres (9.3 million hectares) on the Reserve has been intensively studied to date, more than 1,000 known archaeological sites within NPR-A have been identified.

Surveys of the Howard Pass-Inyorurak Pass Area, as well as many of the larger lakes located in the Howard Pass Quadrangle (1:250,000 scale USGS quad), show a high density of sites.



Universal Transverse Mercator Projection



National Petroleum Reserve - Alaska

FIGURE 13



DRAFT EIS DISCUSSION TRACTS

T A B L E 6  
Distribution of Native Allotment Filings\*  
(See Figure 13 For Tract Locations)

Tracts With One or Two		Tracts With Three or Five		Tracts With Six or More	
Tract No.	Number of Allotments	Tract No.	Number of Allotments	Tract No.	Number of Allotments
2	1	10	3	36	7
31	2	15	3	48	16
32	2	17	4	58	9
41	2	26	4	59	6
44	2	34	4	75	6
47	1	35	5	94	6
67	2	55	3	117	6
69	1	71	3	147	14
72	1	88	3	177	8
76	1	100	4	196	12
79	1	127	3		
80	1	160	3		
82	2	161	5		
93	1	176	5		
108	1	179	5		
109	1	197	5		
144	1				
195	1				
Totals	25		62		90

\* All Lessees holding or persons interested in acquiring leases within NPR-A involving lands where private surface overlies Federal minerals, as in the case with Native allotments, are advised that no Federal permits authorizing entry onto the private surface for the purpose of commencing operations or beginning facility construction will be granted until the permit applicant has established that permission from the surface owner to enter on said surface has been obtained. The surface owner permission must be in written form such as a surface occupancy lease.

Table 7 lists tracts (see Figure 13) with sites known to be eligible for the National Register of Historic Places and tracts with known archaeological sites. Its primary source was the Alaska Heritage Resource Survey (AHRs) Index maintained by the Alaska State Historic Preservation Office. The summary is based on data on file through February, 1982 and supplemented by site location data generated by the BLM/USGS NPR-A cultural resource program which is not yet listed on the AHRs Index.

T A B L E 7  
NPR-A Draft EIS Discussion Tracts With Known Archaeological Sites  
(See Figure 13)

<u>Tract Number</u>	<u>Number of Sites</u>	<u>Eligible for Register*</u>	<u>Tract Number</u>	<u>Number of Sites</u>	<u>Eligible for Register*</u>
26	1	yes	378	5	no
54	1	no	393	6	yes
59	2	yes	396	2	no
64	1	no	409	7	no
65	2	no	410	7	no
69	1	yes	411	11	no
83	1	no	412	14	no
84	1	no	413	2	no
85	2	no	421	2	no
87	1	no	424	4	no
98	2	no	425	2	no
104	1	no	430	1	no
109	1	no	436	2	no
112	3	no	437	22	no
125	2	no	438	4	no
133	2	no	439	3	no
134	5	no	440	12	no
147	5	no	441	1	no
148	1	no	443	1	no
150	1	no	444	5	no
160	8	no	445	12	no
161	2	no	446	17	no
176	2	no	447	25	no
177	1	no	448	19	no
179	1	no	449	14	no
195	2	no	450	2	no
196	2	no	452	1	yes
197	1	no	464	8	no
200	1	no	472	42	no
205	1	no	474	1	no
217	2	no	483	1	no
223	2	no	484	4	no
251	1	no	485	4	no
330	1	no	486	1	no
338	1	no	489	4	no
339	2	no	492	2	no
355	2	no	493	2	no
357	3	no	494	2	no
359	2	no	497	44	yes
373	3	no	498	1	no
374	1	no	499	11	no
378	2	no	500	13	yes

\* Contains Sites Meeting Eligibility Standards for the National Register of Historic Places.

Maps identifying the AHRS site designations occurring within each discussion tract are available in the BLM Fairbanks District Offices, Arctic Resource Area Office, North Post Ft. Wainwright, P.O. Box 1150, Fairbanks, AK 99707. These maps identify the exact location of each site within the tract as well as key bibliographic references. Discussion tracts without reported known sites are not necessarily devoid of cultural resources. Most tracts have never been examined for cultural resources, but such examinations will be required of any Permittee prior to commencement of any operation. The number of sites within a tract does not reflect the density of cultural resources within it but rather the intensity and extent of archeological surveys.

Draft EIS discussion tracts which contain properties listed on the National Register of Historic Places (NRHP) are identified so that potential Lessees may plan their activities to allow for sufficient time to comply with Section 106 of the Historic Preservation Act of 1966 and the Archaeological Resources Protection Act of 1979. Not all eligible sites have been listed on the NRHP, so discussion tracts (Figure 11) which contain sites that should be listed on the NRHP are also identified. However, given how little is known of the prehistory and history of the NPR-A, virtually any site in NPR-A potentially qualifies for NRHP listing under the criterion "likely to yield information important in prehistory or history (36 FR 60.6d)."

When surface disturbing activities are proposed within any of the discussion tracts, the affected terrain will have to be examined by the Lessee's archaeologist and checked by BLM. All sites identified as having significant historic or cultural potential by the the Lessee's archaeologist in consultation with BLM will be evaluated for NRHP eligibility.

The archaeological potential of the discussion tracts is a subjective judgment based on familiarity with the terrain and available information. Where no reliable survey data exist for a tract, potential is estimated by extrapolation from similar tracts previously surveyed or from the literature. Low potential is listed for tracts lying under water. Given current knowledge, most tracts are listed as having moderate potential.

The presence of cultural resource sites or NRHP properties does not bar leasing. Given the large size of lease tracts, most surface disturbing activities can be relocated to avoid impacts to cultural resource sites. Consultation with the State Historic Preservation Office and Advisory Council on Historic Preservation by BLM and the Lessee/Permittee is essential to assure appropriate mitigation.

#### IV. RECREATION AND PRIMITIVENESS

During scoping, the public identified recreation as both an existing use of NPR-A and a potential impact. Increased recreational use of NPR-A associated with roads to oil fields could lead to disturbance of peregrine falcon and caribou. Roads and other oil and gas facilities were also seen as potentially degrading to the primitive character of NPR-A.

Most of NPR-A today remains in a primitive state. The human population of NPR-A travels extensively overland by three-wheeled vehicles, snow machines or by plane. Seasonal dwellings or fish camps are scattered throughout the area. Overall the Reserve's 23 million acres (9.3 million hectares) remain a largely natural area, with very few obvious signs of modern man's influence or presence. The Reserve contains many large and small areas of ecological, geological, scientific, educational, scenic and historical value.

The recreational opportunities on NPR-A are limited in relation to the size of the Reserve. Few of the thousands of lakes on the Coastal Plain support sport fish. Game animals are abundant only in some areas and few are of trophy size. In summer the tussocks and boggy terrain make cross-country hiking difficult over most of the Reserve, particularly in the Coastal Plain and northern Foothill regions. Few of the rivers contain sufficient water for floatboating for more than a short period each summer. North Slope summer weather is variable with frequent winds and low fog layers. However, specific parts of the Reserve offer recreational opportunities which are enhanced by the extreme remoteness of the area.

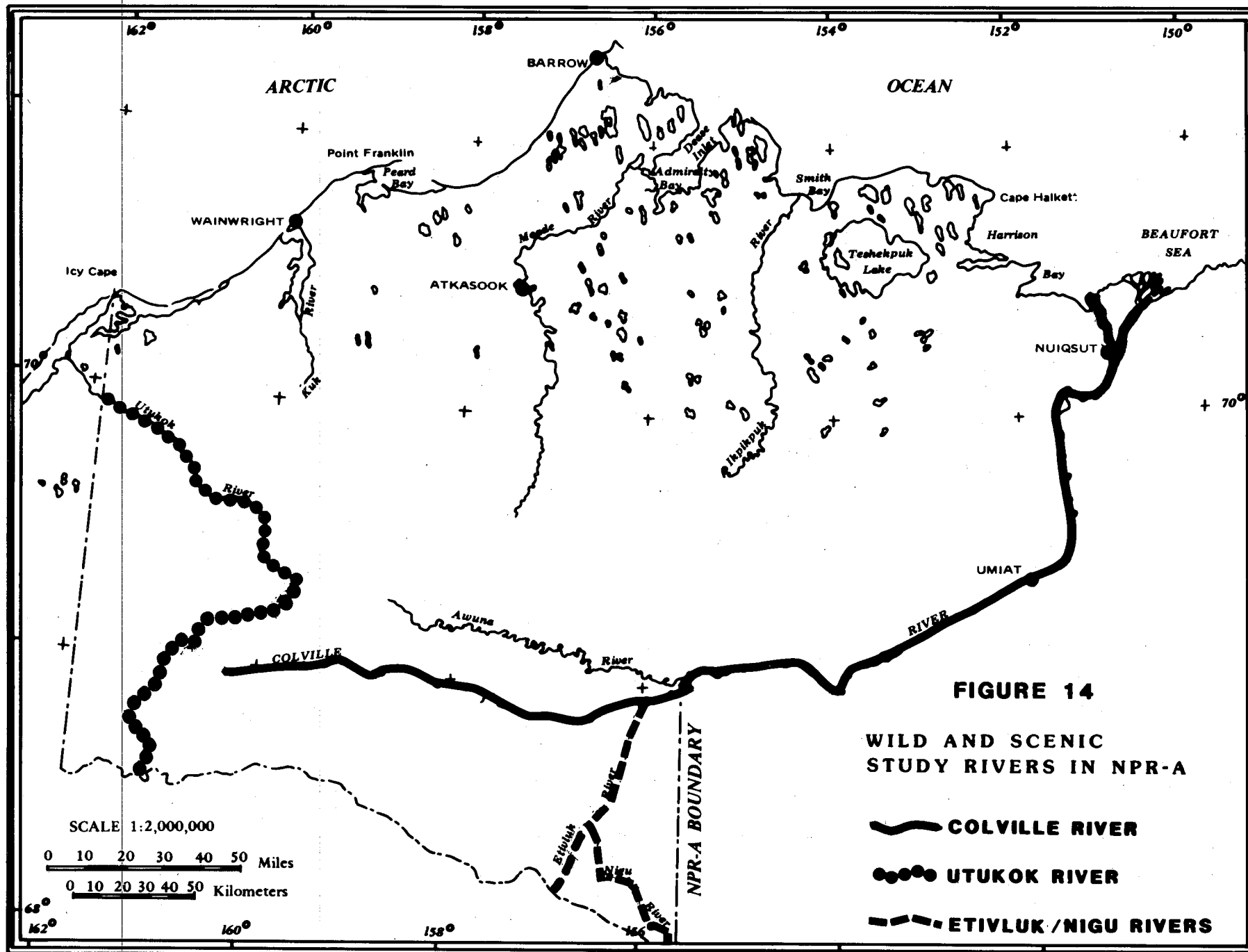
The De Long Mountains along the southern boundary of NPR-A seasonally offer opportunities for backpacking, nature photography, wildlife viewing, limited fishing and hunting and viewing of varied scenery. When such major rivers as the Colville, Utukok, and Etivluk-Nigu contain a sufficient flow of water, they provide opportunities for float trips. The Colville, Utukok and Etivluk-Nigu Rivers shown on Figure 14 are currently in a study status for possible designation as wild and scenic rivers. In 1979, the U.S. Department of the Interior forwarded recommendations to Congress which has until September 1984 to include or exclude them from the wild and scenic river classification. Until Congress makes its decision, four-mile-wide (6-km) corridors centered on the mid-stream of each river are withdrawn from leasing.

Recreation opportunities are also available along portions of the Chukchi Sea coastline. With the prevailing wind at their backs, travelers could paddle small boats or kayaks from Wainwright to Icy Cape. The barrier islands, paralleling the shore for more than half of the distance, offer some protection from the wind and ocean currents. Summer visitors may be rewarded with unusual views of marine mammals migrating just offshore, multitudes of waterfowl, and possibly the drifting pack ice floating close to shore.

Parts of NPR-A may be attractive for experienced winter recreationists. Late winter or early spring is best since temperatures are usually higher and the days are longer than in midwinter. Currently, there is little winter recreational use of the Reserve. However, gentle terrain and wind-packed snow throughout much of NPR-A create conditions favorable for dog sledding, snow-machining, and cross-country skiing.

Because of the difficulty in reaching NPR-A, most of the present recreation-oriented visitors are escorted on tours to Barrow where the area's only tourist activities and facilities are located. Tourism may increase to the Reserve if visitor-oriented facilities and activities are increased.





**FIGURE 14**

**WILD AND SCENIC  
STUDY RIVERS IN NPR-A**

- COLVILLE RIVER**
- UTUKOK RIVER**
- ETIVLUK/NIGU RIVERS**

Source: PL 96-487, Alaska National Interest Lands Conservation Act, Section 604

## V. ENVIRONMENTAL QUALITY ISSUES

Three universal concerns associated with development in any environment are:

- ° Project requirements for gravel and/or sand with resulting effects on soils by erosion;
- ° Changes in air quality; and
- ° Project requirements for water and changes in water quantity or quality.

### A. Soils

The Arctic Coastal Plain is comprised of two major soil units. Roughly centered within the province is a soil unit dominated by sandy eolian, alluvial, and marine deposits. Within this unit, poorly drained soils with shallow permafrost tables occupy most of the nearly level areas and the broad swales between dunes. The soils on dunes consist of eolian sand which is generally thawed and well drained to a depth of about 10 to 20 inches (50-80 cm). Bordering to the east and west is a unit which consists of deep loamy ice-rich soils that are poorly drained and have shallow permafrost tables. Very poorly drained fibrous peat soils are also common within both units as are some well-drained soils along major active drainages.

The dominant soil unit within the lower elevations and gentler slopes of the Foothills province consist of silty colluvial and residual material weathered from fine-grained, nonacid sedimentary rock. These soils are poorly drained and generally ice-rich with a shallow permafrost table. A few well-drained soils can be found within this unit along narrow river terraces, sharp ridge lines, and along a few short south-facing slopes near ridge crests. On the more rugged uplands in the northern Foothills many of the soils are formed in a very gravelly material weathered from sedimentary rock. Near the Brooks Range a few soils have formed in a very gravelly glacial drift. These soils are generally poorly drained with shallow permafrost tables except along steep south-facing slopes.

The Brooks Range area is dominated by steep rocky slopes and thin gravelly soils on vegetated lower slopes and in valleys. In lower valleys some soils have formed in gravelly glacial till or gravelly colluvium or residual material weathered from calcareous rock. Some well-drained soils are located on gravelly ridges, hilly moraines, south-facing colluvial slopes and along major active drainages.

Polygonal ground is characteristic of permafrost regions and is widespread in the NPR-A. The polygons are easily seen in summer, but are visible in winter as well because of unequal snow distribution. Polygons range from about 30 feet (10 m) to about 200 feet (70 m) in width. The edges of polygons may be masked by sedge tussocks. Polygons are separated by interconnected ice wedges whose tops are a few inches to several feet wide and which extend to depths of 10 (3 m) to about 18 feet (6 m). Most of the polygons visible on the surface of the Coastal Plain have central depressions and upthrust ridges at their outer edges that impede drainage from within the polygons.

Wherever the slope of land permits drainage, "high-centered" polygons may form. Where the tops of the ice wedges between polygons thaw and the water drains off, the edges of the polygon will slump into the trough created by melting. This continuing process produces ditches between the polygons.

Permafrost is also responsible for the formation of ice-cored mounds and pingos, some of which are 100 feet (30 m) high. The upward thrusting characteristic of pingos is related to the growth of an ice mass fed at the bottom by a water supply enclosed in a permafrost basin.

Degradation of the insulating quality of the tundra cover over permafrost increases the range of temperatures in near-surface permafrost and induces deeper thaw. Such damage on slopes can initiate erosion that may continue for many years. In flat areas, damage to surface cover can cause melting of ground ice and the formation of thermokarst topography. In addition, destruction of tundra often creates mudholes and ruts which modify wildlife habitat and compound problems of construction and maintenance.

#### B. Air Quality

In general, the air quality on the North Slope, including the NPR-A, is very good and no violations of ambient standards have been documented in this region. The NPR-A is generally characterized by a relatively strong wind field. This minimizes the likelihood of pollutant buildup. However, in winter the Arctic Coastal Plain is subject to inversion (ice fog conditions) which may trap pollutants near the surface.

#### C. Water Resources

Precipitation (primarily snow), surface storage and runoff, evaporation, transpiration, and sublimation are the major hydrologic processes in the Arctic. The hydrologic regimen of NPR-A is dominated by spring breakup and snowmelt runoff.

Surface storage plays a principal part in the NPR-A hydrologic cycle. Numerous lakes and virtually continuous permafrost greatly increase active storage on the Coastal Plain. River and lake ice cover provides surface storage in the mountains and Foothills. Aufeis is comparatively rare in the NPR-A.

Ground water flow systems play only a minor role in the hydrology of the NPR-A. The depth of the active layer on the Coastal Plain is about 2 feet (about 0.6 m), but the active layer stores enormous amounts of water where surface drainage is poor. Near and below deep rivers and lakes, an unfrozen zone (talik) may extend below the surrounding permafrost surface, and pockets of water may remain unfrozen there year-round, but the bottom sediments are usually fine-grained and yield little water when tapped by wells. The permafrost barrier severely limits ground-water recharge and discharge in the NPR-A.

NPR-A rivers and streams generally are classified in three broad categories based on the physiographic province of their origin. Rivers with the greatest discharge (Colville and Utukok) rise in the Brooks Range and northern Arctic Foothills; rivers originating in the southern Arctic Foothills are of medium length and discharge; and those originating in the Arctic Coastal Plain are short and have a small discharge.

Runoff in the NPR-A is characterized by a snowmelt flood in the spring and generally low flow throughout the summer, punctuated by infrequent rainstorm floods. Runoff from rainstorm floods may exceed that of spring runoff, especially on rivers with headwaters in mountains where heavy summer rainfalls may be combined with snowmelt.

Lakes dominate the surface of the Coastal Plain in the NPR-A. In many of them the long axes are oriented slightly west of north. The morphology of the Coastal Plain thaw lakes (the most common type of lake) appears to be primarily controlled by ground ice volume, local and regional relief, and basin age.

The largest thaw lakes on the Coastal Plain would be expected to exist in areas of fine-grained, ice-rich sediments where lake expansion is unconstrained by local relief. The orientation of the thaw lakes is primarily linked to preferential shoreline erosion induced by waves and nearshore currents perpendicular to the prevailing summer winds and the local relief. Lakes formed by the action of Pleistocene or more recent glaciers occur in the mountainous section of the NPR-A. Most of the upland lakes appear to have been formed in geomorphic depressions.

Near the coast, the lake water-level elevations range from zero to 50 feet (0 to 16 m) above sea level and depths range from 3 to 20 feet (about 1 to 6 m). However, most of these lakes are about 3 feet (1 m) deep. Lakes further inland on the Coastal Plain range from 50 to about 400 feet (15 to 120 m) above sea level and depths range from 3 to 60 feet (about 1 to 20 m), but again most of the lakes were less than 3 feet (1 m) deep. Depth in lakes in the southern Foothills and Brooks Range area at altitudes of 1,700 to 3,300 feet (520 to 910 m) range from 3 to 100 feet (1 to 30 m), but most are less than 18 feet (5 m) deep. Lakes less than 6 feet (2 m) deep freeze to the bottom in winter. Therefore, lake depth is a major factor in determining the feasibility of using a lake as a water source in winter.

The water of streams and rivers within the NPR-A is generally soft and dilute of the calcium bicarbonate type except where it is affected by salt water near the coast. Total dissolved solids (TDS) measurements indicate concentration of less than 100 milligrams per liter (mg/L), with few exceptions during the open water period. The general range of values in chemical quality analyses indicate that quality is a function of discharge. In the case of dissolved solids, the concentration is highest when discharge is lowest.

A major factor in the variability of water quality in all surface waters in NPR-A is extensive freezing. Deep parts of river channels (such as in the Colville) have free water beneath the ice during the winter. When ice cover has reached its maximum thickness, the small amount of water remaining in river pools becomes quite saline or mineralized as a result of concentration of the salts rejected by the ice and, in some places, contact with brackish bottom sediments.

Water from lakes near the Arctic coast is of the sodium-chloride type with chloride concentrations of up to 30 mg/L. However, most lake waters on the Arctic Coastal Plain are of a calcium- or magnesium-bicarbonate type. Most of the analyzed water is soft to moderately hard and has a low to moderate total dissolved solids (TDS) concentration. Numerous investigators report high concentrations of iron in Coastal Plain lakes.

The formation of thick ice cover on lakes and ponds has the same effect as it does on river pools. The remaining water has a high specific conductance and may be saline. Some lakes experience severe deoxygenation beneath the ice in the winter. Deep snow cover on some lakes reduces the light penetration and slows the photosynthetic activity which can further reduce dissolved oxygen levels. Ice cover lasting for eight months also prevents atmospheric oxygen from reaching the water.

Water in lakes and ponds in the Arctic Foothills and Brooks Range is of calcium-bicarbonate type and is soft to moderately hard (10 to 100 mg/L  $\text{CaCO}_3$ ). All of the reported sulfate, chloride, and TDS concentrations appear to be significantly below recommended limits for drinking water, but reported iron concentrations exceeded these limits.

## CHAPTER THREE. EIS ANALYTICAL CASES AND POSSIBLE EFFECT ANALYSES FOR SELECTED VALUES

### I. INTRODUCTION

This chapter is divided into two parts: a discussion of hypothetical types and levels of NPR-A oil development activities leading to the establishment of an analytical basis for impact prediction; and an analysis for moderate risk resources and issues (see Chapter One) receiving a general EIS effect and mitigation analysis.

### II. HYPOTHETICAL NPR-A OIL DEVELOPMENTS

Although the BLM is uncertain whether any development will occur within NPR-A, this EIS assumes that it will. To facilitate discussion of the likely types and level of impact which could result from NPR-A development, several hypothetical oil fields were developed and combined into analytical cases. Gas production was determined to be uneconomical and was not considered. These cases are described in a paper prepared by Shepard, Bennett and Gilliam (1982) which is incorporated by reference into this EIS. Table 8 lists the hypothetical fields showing an assumed number of wells and barrels of recoverable oil (BBL-RO) for each field. The discussion concerning the design and operation of those hypothetical fields also is drawn from Shepard et al. 1982. Some of the discussion of exploration activities is based on information provided by drilling firms.

#### A. Exploration

The oil exploratory program within NPR-A is anticipated to include between 14 and 18 exploratory wells over a period of 16 years (Shepard et al. 1982). Leases in NPR-A carry a 10 year primary term. Leases that have resulted from the first two NPR-A sales will expire in 1992 and leases issued in 1987, the last year of the five year leasing program considered in this EIS, will expire in 1997. Within these 16 years, one or two exploratory drilling rigs could adequately drill these 14 to 18 exploratory wells although additional drill rigs would be used to delineate the boundaries of any discovery. This level of exploratory activity is equivalent to the Federal exploration program conducted from 1977 through 1981. BLM is familiar with the possible environmental effects of exploration and already has stipulations and regulations in effect governing exploration activities. Exploration is not likely to produce any NEPA significant effects.

It is likely that the infrastructure of shore bases, airstrips, etc. developed in support of the Federal exploratory program would provide support for at least the initiation of a new private industry program. The workforce requirements of one exploratory drilling rig are estimated at 50 employees at the work site at any time (Dallas Cross, Alaska United Drilling, pers. comm. 1982). Because some crew members would work two weeks on and one off while others would work two on and two off, it may require 86 workers to cover these 50 jobs.

T A B L E 8  
Analytical Cases By Case Number

<u>Hypothetical Fields</u> <u>(or Field Complexes)</u>	<u>Assumed</u> <u>Number of</u> <u>Wells</u>	<u>Assumed</u> <u>Date</u> <u>Production</u> <u>Commences</u> *	<u>Assumed</u> <u>Total</u> <u>Reserves</u> <u>(BBL-RO)</u>
<u>Case One</u>			
Liberator	149	1990	543,850,000
Prince Creek	149	1990	543,850,000
<u>Case Two</u>			
Chipp River/Alaktak Complex			
Chipp River	149	1997	543,850,000
Alaktak	92	1998	335,300,000
Smith River/Kogru Complex			
Smith River	92	2000	335,300,000
Kogru	149	2002	543,850,000
<u>Case Three</u>			
Liberator	149	1990	543,850,000
Avingak/Utukok Complex			
Utukok River	149	2003	543,850,000
Avingak Creek	92	2003	335,300,000
<u>Case Four</u>			
Liberator	149	1990	543,850,000
Peard Bay/Point Belcher Complex			
Peard Bay	149	2002	543,850,000
Point Belcher	92	2002	335,300,000
Avingak/Utukok Complex			
Utukok River	149	2003	543,850,000
Avingak Creek	92	2003	335,300,000

\* A burst of activity involving development drilling, road, pipeline and facility construction would occur in each case for two to three years before production commences.

These would not be new jobs. NPR-A exploration may do nothing more than provide additional work for exploratory drilling rigs and crews already in Alaska. The additional direct employment and population effect of NPR-A exploration thus would be to maintain existing jobs and households and not the creation of new jobs and households.

#### B. Development and Operation

It is likely that directional drilling (deviated, bent or angle drilling) would be used in NPR-A production fields where subsurface geology is favorable and that the wells listed in Table 8 would be consolidated on multi-well pads as at Prudhoe Bay and Kuparuk fields. The various combination of hypothetical fields, including roads and pipelines, are shown in Figures 15 through 18.

With each production well draining 160 acres (65 hectares) of subsurface, each multi-well pad could support 16 production wells. The large fields would have an estimated ten pads and the small fields would have six pads ( $149/16 = 9.3$ ;  $92/16 = 5.75$ ). However, because oil-bearing structures vary in shape, modifications were made for the hypothetical NPR-A fields to more closely approach reality. Large fields were allowed 7-12 pads per field and the small fields 4-8 pads per field for analysis purposes (see Figure 19).

Assuming each production well drains 160-acres of subsurface, each pad of 16 wells would drain a subsurface area of about 2,560 acres (1024 hectares). The larger fields (at ten pads per field) would drain a total subsurface area of about 25,600 acres (10,240 hectares) and the smaller field (at six pads per field) would drain a total of about 15,360 subsurface acres (6,144 hectares).

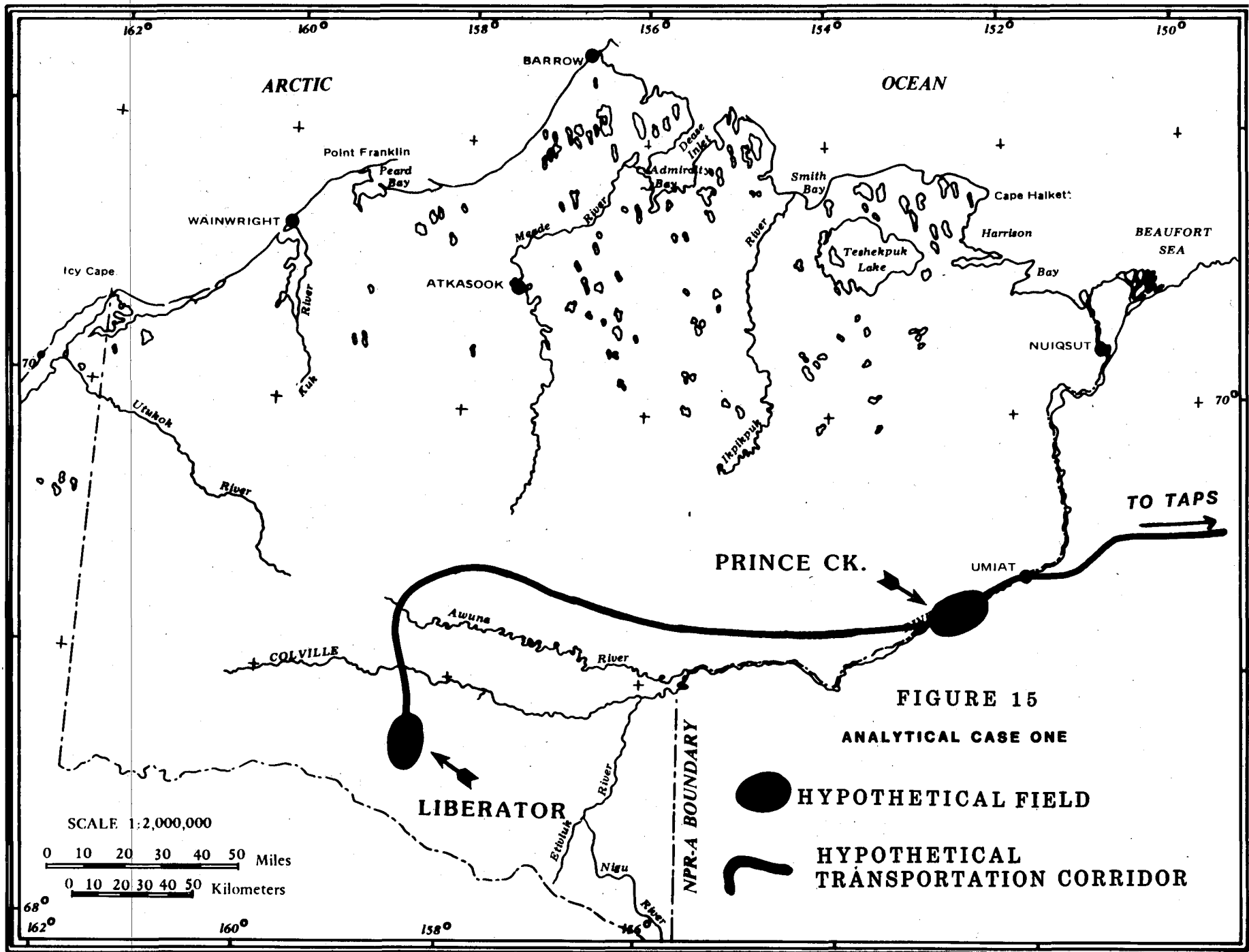
The surface extent of facilities would vary as a function of the shape of the subsurface structure, but the large fields would probably have surface disturbance effects spread over small portions of approximately 1.5 - 2.2 Townships at a minimum, or 54-80 square miles (140 to 208 sq km). Small fields would occupy small areas of 1.0 - 1.7 Townships or 36 - 61.2 square miles (93 to 160 sq km) at minimum. Only a small percentage of the surface area within a field would be occupied by facilities. However, fish and wildlife habitats within or adjacent to the field could be altered and/or influenced by oil activities. Animal behavior and diversity also may change in response to the proximity of a development field.

It is estimated that in-field gathering pipelines would require a final 50 foot (15.2 m) or larger right-of-way. Any roads to pads from the main camp pad and airstrip would parallel pipelines and be 30 feet wide (9.1 m). All-season airstrips, given current arctic technology, would be approximately one mile (1.6 km) long and 300 feet (91.2 m) wide.

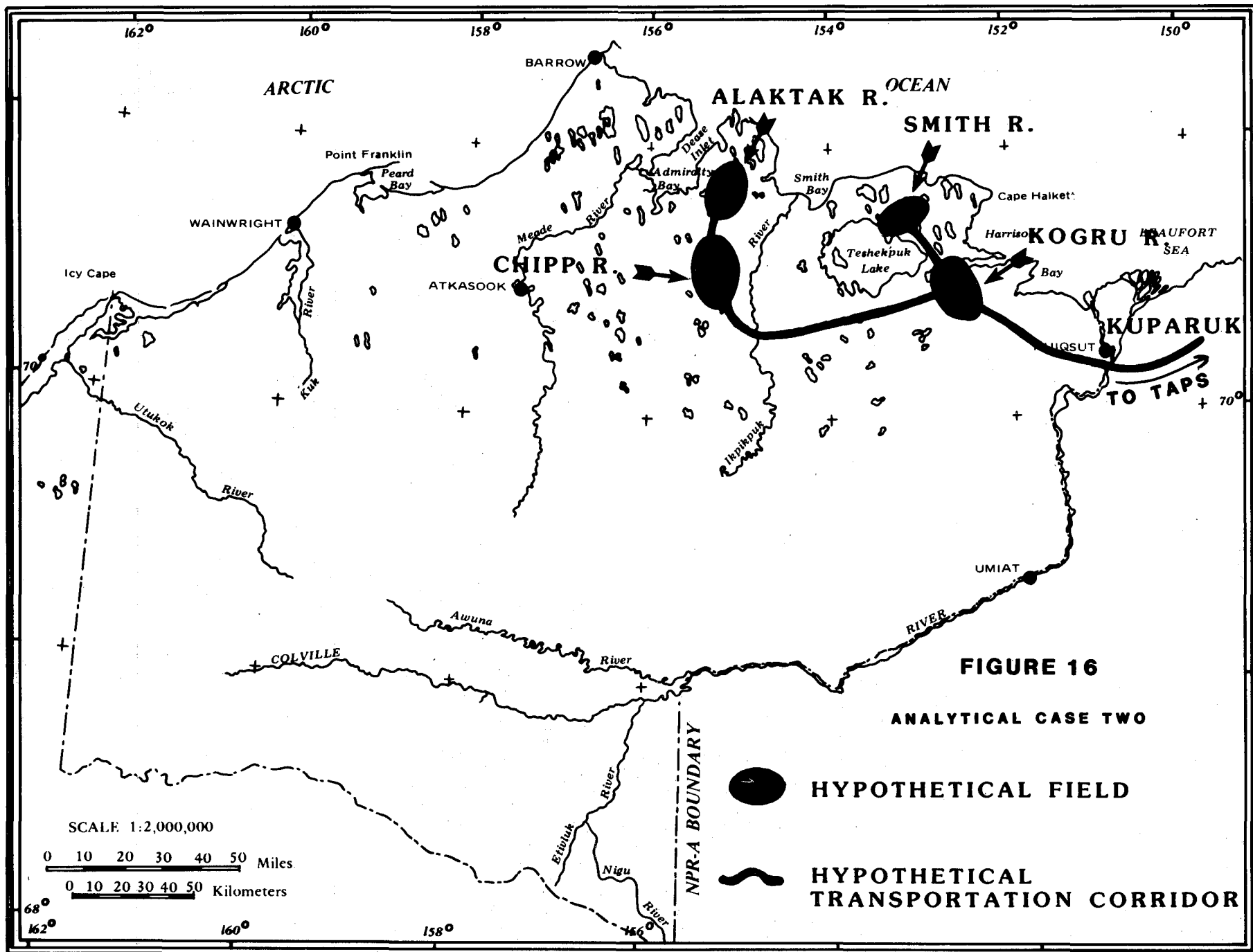
The development of these hypothetical fields and construction of supporting roads and pipelines would create job opportunities. These jobs are shown in Table 9.

The establishment of onsite housing facilities or "enclave" for workers is a standard practice for arctic operations. Most North Slope oil field workers settle their families in urban areas of Alaska and commute to the work site by air (State of Alaska, 1982).

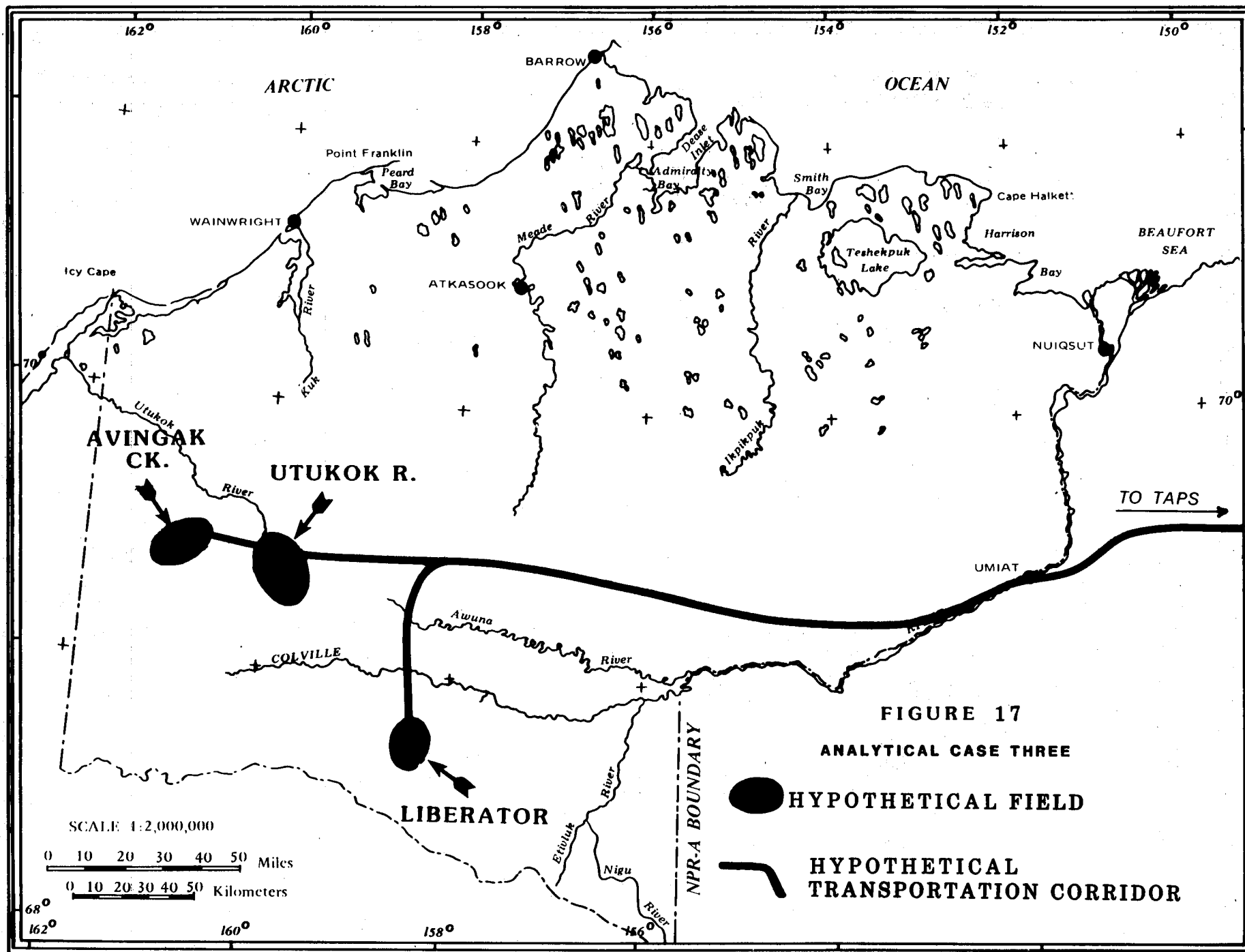




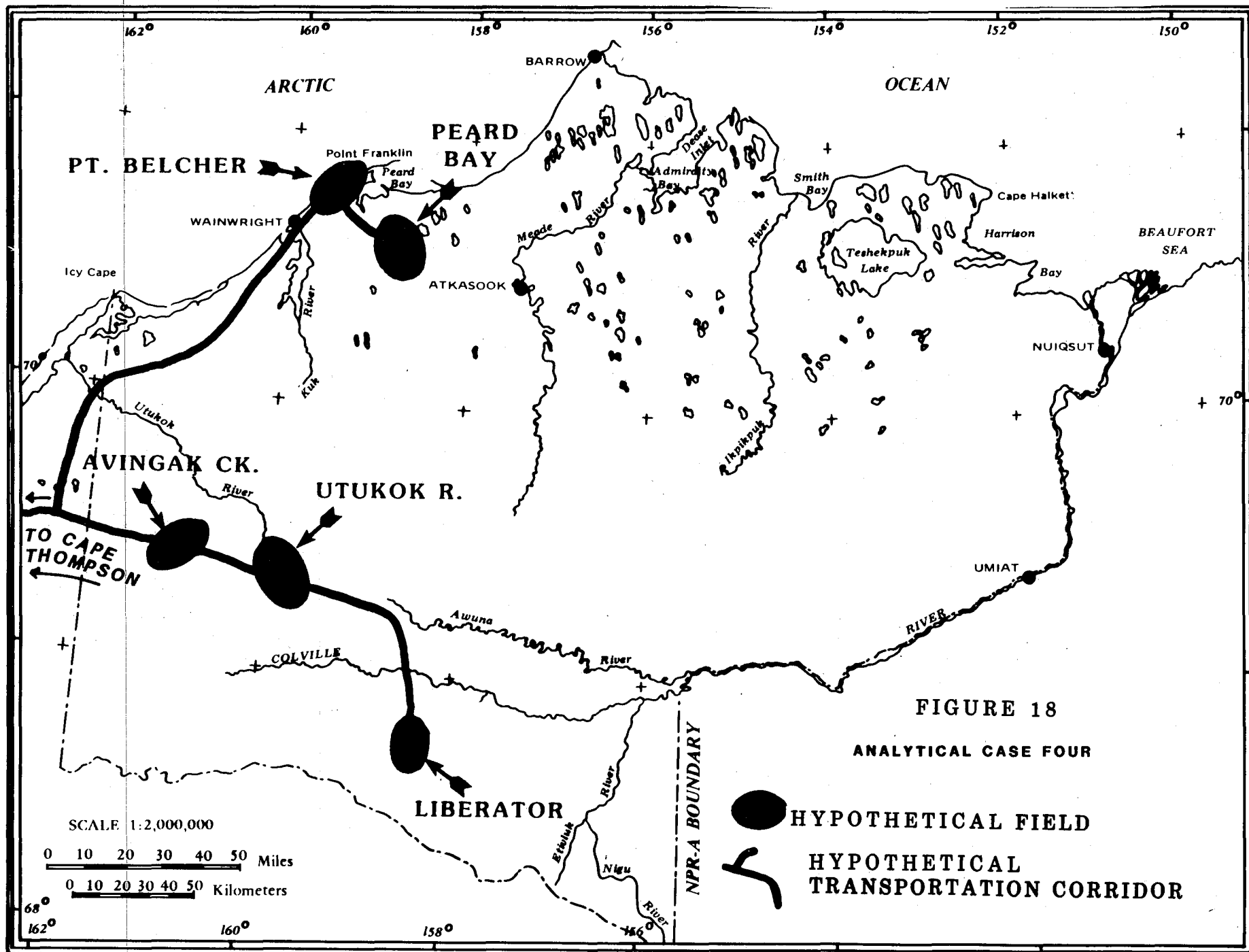
Source: Shepard, et al., 1982



Source: Shepard, et al., 1982



Source: Shepard, et al., 1982



Source: Shepard, et al., 1982

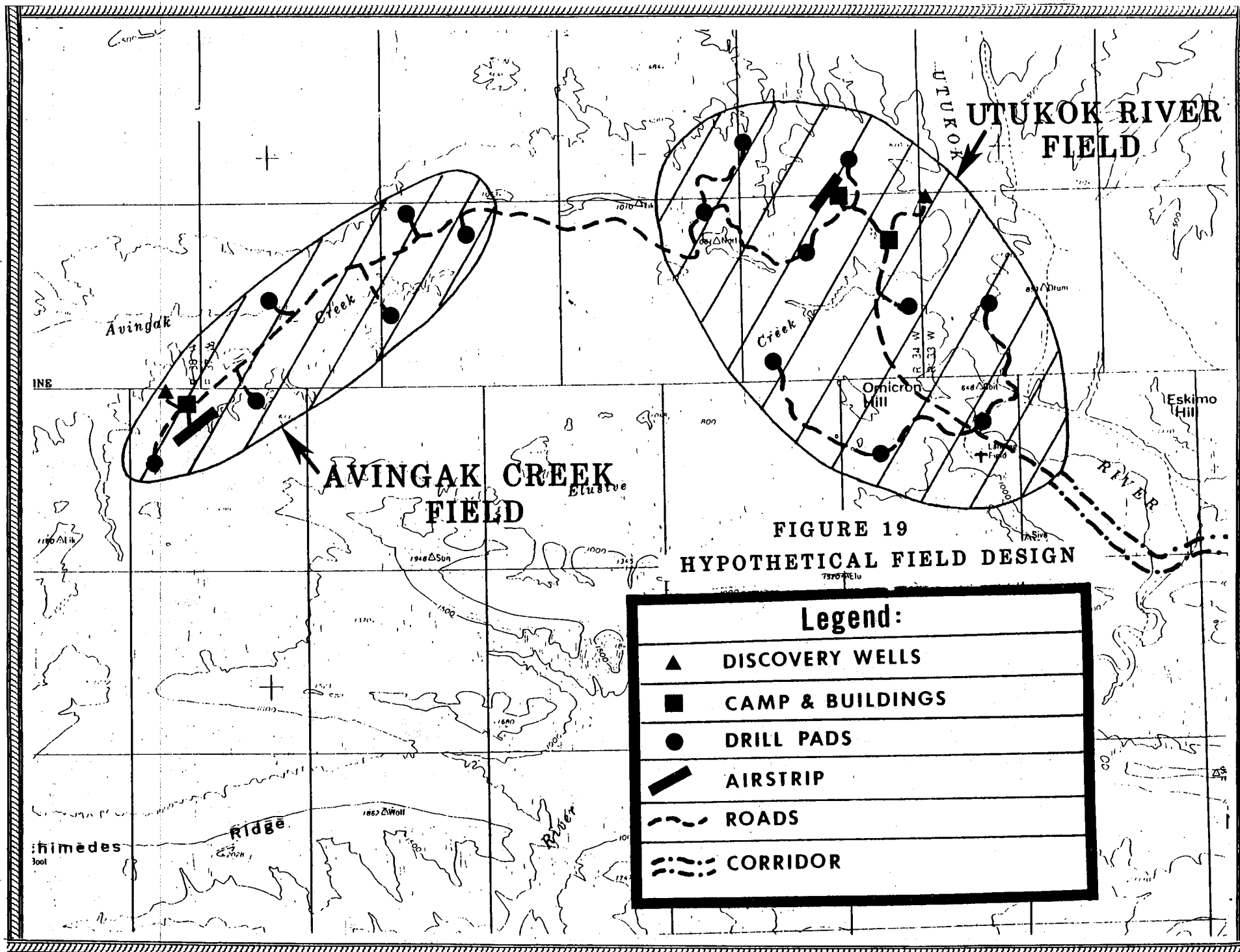


FIGURE 19  
HYPOTHETICAL FIELD DESIGN

Source: Shepard, et al., 1982

T A B L E 9  
Potential Construction Employment

<u>Hypothetical Activity</u>	<u>Assumed Peak Work Force</u>	
	<u>Large Field</u>	<u>Small Field</u>
Build Additional Well Pads	60	30
Drill Development Wells	125	65
Assemble Central Production Facility (CPF)	750	750
Build Base Camp and Assemble Camp Buildings	*	*
Build Intrafield Roads and Pipelines	120	90
Build Pipeline/Road Maintenance Camps	200	90
Build Pipeline	1000	Would share large field pipeline.
Assemble Pipeline Pump Stations	60	

\* Extension of the same personnel that worked on the CPF.

Total peak employment for all concurrent activities associated with the construction phase of development of one large field is assumed to range from 2,095 to 2,315 workers.

Operations and maintenance of the hypothetical fields are assumed to involve a number of permanent employees as indicated in Table 10 below.

T A B L E 10  
Potential Operation, Maintenance, Overhead and Oilfield Service Employment\*

	<u>Liberator</u>	<u>Utukok</u>	<u>Avignak</u>	<u>Totals</u>
Oil Company Field Workers	490	490	300	1,280
Oil Company Overhead Personnel	90	90	90	270
Oil Field Service Workers	<u>140</u>	<u>140</u>	<u>95</u>	<u>375</u>
Totals	720	720	485	1,925

\* Based on Analytical Case Three, Figure 17.

At least three flights per week with turbo prop or jet airliner may be required to rotate the work force shown in Table 10 between the NPR-A and their households. In addition to shift change flights, one supply flight using Hercules, Electra or other aircraft could land at an NPR-A field approximately every other day. Total flight operations for small fixed wing and rotary wing aircraft were not estimated.

In addition to potential wildlife disturbance from air traffic below 1,000 feet (304 m), it is estimated that at least 12 to 15 trucks per month would travel to and from the hypothetical oil fields via support roads connecting to the Dalton Highway or to the coast above Kotzebue. Vehicle traffic on these roads could disturb present wildlife use.

### C. Cumulative Development

Table 11 displays other areas where North Slope fields could operate concurrently with NPR-A fields (Shepard et al. 1982). Table 12 compares the aggregate Reserve estimates of these fields to a recent estimate by the U.S. Geological Survey. An export coal mine near Point Lay, the Cominco mine south of the Brooks Range, and the fields from Table 11, could be considered as a cumulative impact to the Arctic environment as NPR-A fields come into production.

T A B L E 11  
Estimated Distribution of North Slope  
Fields Other Than Prudhoe and Kuparuk

<u>Field Location</u>	<u>Potential Quantity</u> <u>in Barrels</u>
Beaufort Sea	3,565,000,000
Arctic National Wildlife Refuge	2,471,000,000
Beaufort Sea	2,348,000,000
Chukchi Sea	1,518,000,000
Beaufort Sea	1,377,000,000
Chukchi Sea	990,000,000
Beaufort Sea	839,000,000
Alaska Uplands East of NPR-A	802,000,000
NPR-A	543,850,000
NPR-A	543,850,000
NPR-A	335,300,000
Total	15,333,000,000

T A B L E 12  
USGS Mean Recoverable Resource Estimates  
(Undiscovered North Slope Oil Reserves)

Arctic Coastal Plain	4,400,000,000
Northern Foothills	1,400,000,000
Southern Foothills/Brooks Range	201,000,000
Beaufort Near Shore	7,000,000,000
Beaufort Deeper Waters	800,000,000
Chukchi Near Shore	1,400,000,000
Chukchi Deeper Water	200,000,000
Totals	15,400,000,000

#### D. Oil Spills Risk and Response Analysis

In response to commentors on the Draft EIS who said that the oil spill risk and response section was incomplete, the following more detailed summary of TE-3 Oil Spills Associated With NPR-A Development (Carufel, Bennett and Shepard, 1982), produced in support of the Draft EIS is offered.

##### 1. Introduction

Oil and fuel spills, depending on their volume, and well blowouts represent several potential hazards. The danger of loss of human life or serious injury to workers and damage to the environment can result from the toxic effects of the spill. Physical damage to equipment, structures and terrain can also occur. This analysis of the risk of oil spills is based on available data on the frequency and size of spills and blowouts within the United States and estimates of the likely number of wells in NPR-A should discoveries be made.

##### 2. Types of Spills

The three classifications of oil spills associated with development and operation of oil fields are blowouts of crude oil during well drilling or production, incidental spills and pipeline or other transportation spills. Incidental spills usually are of refined petroleum products, such as fuels and lubricants but also could involve crude oil.

##### a. Spills Related to Blowouts

Oil and gas exploration and production occurs on only a small percent of Alaska lands. Data used on blowout frequency and spills were obtained from industry representatives; from the Environmental Protection Agency (EPA); U.S. Coast Guard; U.S. Bureau of Land Management (BLM), Alaska, Office of Special Projects (OSP); U.S. Geological Survey (USGS); and Alaska Oil and Gas Conservation Commission.

Heavy equipment loss, pollution control expense, and drilling delays can result from blowouts. Usually blowouts are gas and oil combinations, but there also can be gas well blowouts and oil well blowouts. Gas well blowouts are much more dangerous and explosive. However, gas blowouts leave little residue on land and water when compared to crude oil. Geographic locations and time of year are important considerations to petroleum contaminant loading.

In January 1969, a blowout in Santa Barbara, California caused a significant oil spill. Other serious blowouts and fires occurred in 1965 and 1970 in the Gulf of Mexico. These incidents plus earlier blowouts and fires prompted the industry and the Federal government to conduct several safety investigations of oil and gas operations. The investigations resulted in voluntary major changes by industry in drilling and production operations. Combined with stiff government regulations, the changes have resulted in a significant improvement in the safety record.



Blowout and Explosion Data: The following data are taken from an Alaska Oil and Gas Conservation Commission memorandum dated November 6, 1981:

Based on data presented by Danenberger (USGS Circular 741, 1976) the following comparisons and ratios can be made for all United States Outer Continental Shelf (OCS) operations from 1971 through 1978:

<u>New Wells Drilled</u>	<u>Blowouts at New Wells</u>	<u>Workovers*</u>	<u>Workover Blowouts</u>	<u>Volume Spilled (Barrels)</u>
7,553	0	19,048**	3	725

\* reentry into and maintenance of production wells

\*\* estimated, based on the need to workover a well each five years

Blowout Record in Alaska Since 1957: Data on Alaska oil well blowouts for the period from 1957 through October 1981 are:

1,450 - wells drilled  
0 - oil well blowouts  
0 - oil spillage from blowouts

Data Summary: During all OCS operations from 1971-78 and all operations in Alaska through mid-October 1981, there were no oil well blowouts during exploration and development well drilling. During production and workover operations three oil well blowouts spilled 725 barrels of oil.

Used in a probability framework, these data show almost no chance of a blowout during NPR-A exploration. The probability of an oil blowout and spill during production from any single well would be .0002 (three production based spills divided by 19,048 workovers). Because a probability of .0000 never can be assumed and because the blowout rate for workovers is greater than the blowout rate for exploration and development drilling, the probability of a blowout during exploration for any single well was set at .0001.

Estimate of Likely Number of NPR-A Blowouts: Multiplying all of the probabilities of no blowouts and subtracting that figure from 1.000, can result in several possible outcomes. The probability of no blowouts for all phases of NPR-A development is .713; the probability of one blowout is .274; and the probability of more than one is .013. The most likely number of NPR-A blowouts from all phases of exploration and production, therefore, is zero (0).

#### b. Incidental Spills

The Alaska Oil and Gas Conservation Commission (State of Alaska, 1981) gathered and published data on the frequency of incidental spills on the North Slope of Alaska of stored crude oil, crude in transit, fuels, lubricants, etc. These data shown in Tables 13 and 14 indicate a clear relationship between the level of industrial activity and the number of spills.

T A B L E 13  
Incidental Oil Industry Spills on the North Slope, Alaska

<u>Year</u>	<u>Average Size of Spill</u> (in barrels)	<u>Three Year Moving Average*</u> (in barrels)
1976	40.9	N/A
1977	21.4	N/A
1978	4.8	22.37
1979	2.7	9.63
1980	5.1	4.20
1981	2.2	3.33

\* Moving averages highlight underlying trends.

Table 13 indicates that industry has improved its ability to reduce the size of spills. The 3.33 barrels (or 140 gal.) spilled per average incident from the last row in Table 13 provides the basis for an estimate of the total volume of incidental spills. Before such an estimate can be generated, it is necessary to forecast the number of incidental spills for each field. The data in Table 14 are useful for estimating the number of spills.

T A B L E 14  
Relationship Between Wells and Incidental  
Spills At Prudhoe Bay, Alaska

<u>Year</u>	<u>Number of</u> <u>Producing</u> <u>Wells</u>	<u>Number of</u> <u>Incidental</u> <u>Spills</u>	<u>Rank Pairs</u>
1976	4	27	1,1
1977*	107	52	2,2
1978	159	86	3,4
1979	197	81	4,3
1980	238	123	5,5

\* Trans Alaska Pipeline System (TAPS) became operational

While the data in Table 14 are inadequate to draw strong conclusions, they indicate a high correlation between an increase in the number of wells and an increase in the frequency of incidental spills.

Incidental Spill Forecast For Hypothetical NPR-A Fields: The hypothetical forecast for NPR-A includes an estimate of two large hypothetical fields of 149 wells each and a small field of 92 wells. By interpolation from the above data, the number of incidental spills for NPR-A (Table 15) can be estimated, along with the estimated volume for all spills (Table 16).

T A B L E 15  
Incidental Spill Prediction for Hypothetical NPR-A Fields

<u>NPR-A Generic Fields</u>	<u>Estimated Incidental Spills Per Year</u>
First Large Field	77
Small Field	45
Second Large Field	77

T A B L E 16  
Estimated Volume of Yearly Incidental Spills by Field

<u>Small Field</u> (gallons)	<u>First Large Field</u> (gallons)	<u>Second Large Field</u> (gallons)
6000-6500	10,500-11,000	10,500-11,000

It is unlikely that these spills would lead to significant environmental harm. Generally they could occur in areas where the habitat has already been altered. Spills could occur at the airstrip fueling area, around storage tanks, on the camp and well pads, etc. and not in the natural environment. The average size of these spills indicates that they would be relatively small and easily contained before the spill could reach the natural habitat.

c. Pipeline Spill Projections

Moderate and major spills occurring in NPR-A probably would be associated with pipeline operations rather than with field operations. To estimate the number and volume of pipeline related spills, an analysis was made of incidents along the Trans Alaska Pipeline System (TAPS).

In the 1,249 days from start-up through January 1, 1981, the TAPS (exclusive of tanker spills in Valdez but including pipeline spills due to sabotage) had 41 minor, 15 moderate and 7 major incidents involving spills of crude oil or refined petroleum products (Hunt, 1982). The respective average sizes of these spills are (a) minor spills of about 250 gallons (mean of all spills); (b) moderate spills of about 4,100 gallons (mean of all spills); and (c) major spills of 63,000 gallons (median of the seven spills).

Spills less than 100 gallons resulting from chronic drips from small containers and vehicle fuel tanks, leaks from hydraulic hoses breaking, draining of engine oil and overfilling of fuel tanks were not considered because these spills rarely reach the natural environment. All other incidents were converted to an incident rate to estimate the likely level of oil spills associated with NPR-A development. That rate is the spills per mile of pipeline per day of operation. The TAPS spill rate for incidents between 100 and 999 gallons is .000044; for moderate spills .000016; and a rate of for major spills .000008.

The working hypothesis adopted was that there would be about 200 miles of pipeline between NPR-A fields and TAPS and that production in NPR-A would occur over 30 years. Using the above spill rates and based on this working hypothesis, the estimated numbers and volumes of NPR-A related pipeline spills shown in Table 17 were derived.

T A B L E 17  
Projected Pipeline Spills Associated With  
Delivery of NPR-A Crude Over 30 Years

<u>Class of Incident</u>	<u>Number of Events</u>	<u>Volume Spilled (gallons)</u>	
		<u>Total</u>	<u>Average</u>
Minor	90 - 110	22,500 - 27,500	250
Moderate	35 - 40	143,500 - 16,4000	4,100
Major	15 - 20	945,000 - 1,260,000	63,000

In areas of generally dry tundra (tussock, mixed meadow/tussock, or alpine tundra), a spill of 63,000 gallons of crude oil or refined petroleum products could be contained by the spill response effort but may be the most damaging ecologically. The microtopographical relief of the tussocks would absorb the spread of oil in the tussock and mixed meadow/tussock areas. The broken terrain in the alpine areas similarly would become natural barriers to the spreading oil. Affected vegetation and the wildlife habitat could be permanently lost. Direct mortality of wildlife would be limited.

Uncontrolled spills on wet tundra, wet sedge meadows and in lakes and rivers could be spread over large areas by wind and current. Based on previous studies of uncontrolled spill dynamics, spills of 63,000 gallons of crude oil or refined petroleum products could spread over more than six miles of lake surface and/or travel the entire length of a river affecting all aquatic and terrestrial life in its path.

However, given an adequate response time for the clean-up team, spills in wetlands and aquatic habitats may be the easiest to contain and clean-up because the oil would float at the surface enabling effective containment, removal and recovery operations. While the short-term destructive capability of uncontained oil spills into aquatic environments cannot be denied, it is believed that wetlands and waterbodies affected may actually recover faster than dry tundra areas.

Based on Carufel et al. (1982), there is a probability of about .995 (about 995 chances in 1000) that at least one of the 15 major spills along the pipeline would be in a wetland. There is a probability of about .966 (966 chances in 1000) that there would be three or more spills in wetlands. Or, assuming that the economic life of the pipeline is about 30 years, a wetland spill would happen (on the average) once every ten years. There is a probability of .59 (about 590 chances in 1000) that there would be six or more spills in wetlands or, on average, one wetland spill every five years.

One factor that significantly reduces the threat of irreparable damage from oil spills is that for eight to eight and a half months each year, all terrestrial and aquatic habitats on NPR-A will be covered with snow or ice. Past experience in the Arctic has shown that spill clean-up in winter proceeds more rapidly and has fewer long-term consequences on the environment.

### 3. Contingency Plans For Oil and Hazardous Substances Spill Response

Each Permittee operating on the NPR-A is required to have an "Oil Spill Response Plan" with trained personnel and clean-up equipment at each activity site to meet Federal and State regulations. The response plan includes an action plan and a list of contacts in State and Federal agencies with direct responsibilities in the event of a spill as well as private companies that can be called on for further information or assistance.

The State of Alaska, Department of Environmental Conservation, is responsible as the On-Scene Coordinator (OSC) for spills on all lands within the State except the TAPS. The U.S. Coast Guard is responsible for directing spill clean-up on areas of tidewater and the seas.

The OSC must assure compliance with all Federal and State laws. The intent of the applicable laws and regulations is to prevent, as much as possible, hazardous materials from entering water and to insure the rapid removal of these substances from areas where there is a danger of contaminating water. The OSC monitors and documents the operator's actions and determines when the clean-up is satisfactory. The OSC instructs those responsible for the spill as to what additional measures are to be taken.

Federal interest in a spill does not cease with clean-up. If Federal resources are involved, the government could seek damages. The government conducts thorough studies of the cause and effects of such discharges to prevent future occurrences.

#### E. Induced Employment

In addition to the possible oil field construction and operation jobs discussed above, new jobs may be created in the Alaska economy in response to NPR-A development. These derivative, or induced, jobs fall into two categories: tax linked jobs and distributive jobs.

Tax linked jobs are supported by State and North Slope Borough government spending. State jobs result from property and severance tax collections and the State's share of the Federal royalties that are spent by operating agencies of the State. Construction jobs on such capital projects as roads, buildings, harbors, dams, etc. are another type of tax linked employment financed by the State out of its property, severance and royalty income. The North Slope Borough creates tax linked jobs when the Borough spends tax dollars it collects on oil field and related property.

Distributive jobs are in the trade and services sectors of the economy. These include jobs in real estate, finance, insurance, wholesale and retail trade, medicine, law, accounting, other professional services and recreation and leisure services. Distributive jobs would increase in response to household spending by project and tax linked workers.

To forecast the total effect on employment of any possible NPR-A development, a forecast of possible project employment and tax linked employment must first be made to allow increases in distributive employment to be forecast. However, given the uncertainties surrounding future oil prices and State of Alaska tax policy, a forecast of tax linked employment would be speculative. In lieu of contracting for the preparation of such a forecast, BLM prepared an analysis (Bennett, 1982) of the relationship between estimated oil reserves and total estimated employment based on previous forecasts of the employment effects of Arctic oil development (Table 18).

T A B L E 18  
Estimated Peak Employment Effect of  
Other Forecasted North Slope  
Development\*

<u>Area Covered</u> <u>By Forecast</u>	<u>Estimated Recoverable</u> <u>Crude Oil</u> (Millions of Barrels)	<u>Estimated</u> <u>Statewide</u> <u>Employment</u> <u>Effect **</u> (Jobs)	<u>Estimated</u> <u>Employment to Reserves</u> <u>Ratio</u> (Jobs per Million Barrels of recoverable oil)
Beaufort Sea (high discovery)	1,900	18,696	9.84 jobs/million
Camden Canning	1,300	10,627	7.59 jobs/million
Cape Halkett	800	5,872	7.34 jobs/million

\* Using the Year 2000.

\*\* Includes project, tax linked and distributive jobs.

Source: Bennett, (1982)

Based on the estimate of 1,400 million barrels of recoverable NPR-A crude oil, development in the Reserve would add 10,200 (1,400 times 7.34) to 13,800 (1,400 times 9.84) total jobs in Alaska.

As peak direct project employment (Table 10) was estimated at about 2000 jobs, included employment is implicitly set at 8,200 to 11,800 jobs.

### III. GENERAL IMPACT AND MITIGATIVE ANALYSIS FOR MODERATE RISK RESOURCES AND ISSUES

This analysis stops at the "could" or "may" happen point; that is, the EIS does not predict specific impacts but instead lists likely effects. This level of EIS analysis is sufficient for moderate risk resources and issues to lead the reader to the model mitigative stipulations already existing or developed to conserve these resources and issues. The list of possible effects is based on a review of existing conflicts between oil and gas development and surface values of areas possibly experiencing oil and gas operations (USGS, 1979). Table 19 lists these possible effects. The fact that an effect has occurred previously and thus is included in the analysis does not imply that it must occur in the future.

T A B L E 19  
Overview of Potential Fish and Wildlife Effects  
(Adapted from State of Alaska, 1982)

<u>Activity</u>	<u>Potential Effect(s)</u>
1) Seismic Exploration	Habitat abandonment due to habitat alterations and/or noise and disturbance, altered behavioral patterns, decreased reproductive success.
2) Site Preparation	Alteration or destruction of habitat, habitat abandonment, interference with migrations and natural movements. Alteration of natural drainage patterns, increased erosion and sedimentation, degradation of underlying permafrost.
3) Noise and Disturbance	Abandonment of critical habitats such as reproductive, feeding, and molting areas; altered behavioral patterns; decreased reproductive success.
4) Drilling Muds and Cuttings	Localized loss of habitat due to reserve pit construction and accidental contamination of adjacent waterbodies.
5) Oil Pollution	Death due to coating, asphyxiation, and poisoning; alteration of food web; interference with biochemical processes or behavioral patterns; sublethal effects such as reduced reproductive success, reduced resistance to disease, or increased stress.
6) Altering of Shorelines, Dredging and Filling of Wetlands, Gravel Removal, and Gravel Pad Construction	Destruction of habitat, alteration of natural drainage systems, water quality degradation increased erosion potential, altered animal migrations or movements.
7) Discharge of Production Waters	If discharged into surface or subsurface waters, the following may occur: destruction of habitat interference with growth and reproduction; direct death due to poisoning; soil and groundwater contamination.
8) Water Withdrawal	Alteration of habitat, depression of ground and surface water table, entrainment of juvenile fish and other aquatic organisms.
9) Increase in Local Population and Changes in Access to Specific Areas	Avoidance of populated areas by wildlife and stress on wildlife from increased recreation activity.
10) Secondary Development (including roads and pipelines)	Loss or alteration of habitat, abandonment of critical habitats and interference with migration and natural movements.

On the basis of this list of possible effects, the EIS can identify mitigations which would eliminate these "possible" effects, or reduce them so substantially that the adverse effects would no longer be significant. Based on the list of possible effects on moderate risk resources and issues, mitigations to eliminate or substantially reduce these effects have been designed. The reader is cautioned that the selection and implementation of these model stipulations in their present form is not guaranteed.

The BLM must consider any comments received in the sale area selection process prior to each lease sale. It must also consider the NEPA compliance procedure required prior to the issuance of any permit for specific activities and sites before deciding on the final wording of lease and/or permit stipulations. The BLM, based on the NEPA compliance document for each permitting activity, will implicitly define the terms "significant" and "vicinity" for each proposed operation.

It is BLM's intent to use the appropriate stipulations in any leasing and/or permitting action that will provide optimal conservation of all other resources and issues while allowing a Lessee to exercise their legal rights to explore, discover and produce petroleum on their lease. It is not BLM's intent to require any applicant to provide project and impact analyses beyond those required for an informed and timely permitting decision cognizant of possible cumulative effects. This is the policy of BLM and is totally in keeping with present BLM leasing and permitting authorities. As such, the model stipulations presented in this section could be considered as applicable, where appropriate, to the "Standard Requirements Leasing Alternative" and the "Design Solution Alternative."

#### A. Possible Effects

Possible effects that may occur to these resources if they are exposed to oil development are discussed in this section.

##### 1. Possible Effects on Moose Could Include:

- ° The alteration or destruction of riparian habitat in the Colville River drainage during gravel removal or construction of pads and road/pipeline rights-of-way;
- ° Road kills;
- ° Interference with natural movements; and
- ° Increased sport hunter access leading to possible harvest above sustainable levels.

##### 2. Possible Effects on Shorebirds, Ducks, Loons, Gulls, Terns, Jaegers and Whistling Swans Could Include:

- ° The alteration or destruction of molting, nesting and/or feeding habitat by proposed operations;



- ° Abandonment of habitats because of noise or other industrial disturbances;
- ° Depletion of energy during severe avoidance reaction when panicked by low-level aircraft overflights or disturbance by humans;
- ° Death due to coating, asphyxiation, poisoning and/or alteration of food supply from spills of oil or toxic wastes; and
- ° Improper garbage disposal could lead to attraction of gulls, terns and jaegers to activity sites leading to possibly increased predation by these birds on local birds, their eggs and young and/or increased chance of avian disease and parasite transmission to other birds.

3. Possible Effects on Wolverine, Wolf, Fox (Arctic and Red) and Dall Sheep Could Include:

- ° Alteration of habitat during gravel removal, pad construction, facility placement or from road or pipeline rights-of-way that eliminates or influences denning habitat and prey species on which wolves, foxes or wolverine depend;
- ° Alteration of lambing areas, movement patterns or mineral licks for Dall sheep during gravel removal, pad or facility construction or for pipeline or road rights-of-way;
- ° Increased sport hunter access leading to possible harvest above sustainable levels; and
- ° Destruction of wolves, foxes (Arctic and red) and wolverines in the interest of public safety.

4. Possible Effects on Soils, Air and Water Quality Could Include:

- ° For soils the extraction of gravel/sand as construction materials has positive and adverse effects. Use of gravel/sand pads would prevent further surface damage at facilities by providing a stable foundation on ice-rich soils. Extraction of gravel/sand if done improperly may increase erosion potential and lead to the formation of thermokarst topography. Wind erosion of active or abandoned gravel/sand roads, airstrips and facilities pads may lead to dusting of adjacent natural vegetation and earlier microhabitat snow-melt patterns. Failure to consider maintenance of natural drainage patterns during design of roads and other structures could also lead to blocked drainages and changes in adjacent vegetative patterns.

- ° For air quality, the emissions within NPR-A would be similar to those from Prudhoe Bay. Table 20 lists data on emissions from one drill site and one well pad at Prudhoe Bay. While a production field should not have an emission level high enough to breach national or state standards, emissions would be noticeable locally.

- ° For water quality, several water quality changes could result from NPR-A exploration and development activities. Overuse of lake water and water from river pools from under the ice during winter would lead to further concentration of minerals in the remaining water with possible toxic effects on overwintering fish. The remote possibility of accidental discharge of produced

waters and/or drilling muds and cuttings could introduce toxic chemicals into the aquatic environments. Oil spills could occur in wetlands with at least short-term degradation in water quality and direct and indirect loss of fish and wildlife resources. Stream crossings during road construction along with gravel removal in flood plains could increase sedimentation in active streams.

T A B L E 20  
Measured Pollutant Levels (mg/m<sup>3</sup>)  
At Prudhoe Bay, Alaska

<u>Pollutant</u>	<u>Monitor Drill Site-9</u>	<u>Location Well Pad-A</u>	<u>Air Quality Standards of the Alaska Department of Environmental Conservation</u>
<u>Nitrogen Dioxide</u>			
1 Hour Maximum	84.0	125.0	---
Annual Arith. Mean	3.5	4.0	100
<u>Ozone</u>			
1 Hour Maximum	113.0	113.0	235
Annual Arith. Mean	51.0	47.5	---
<u>Carbon Monoxide</u>			
1 Hour Maximum	3430.0	3120.0	40,000
8 Hour Maximum	946.0	856.0	10,000
Annual Arith. Mean	133.0	171.0	---
<u>Sulfur Dioxide</u>			
3 Hour Maximum	13.0	25.3	1,300
24 Hour Maximum	9.5	9.3	365
Annual Arith. Mean	0.4	0.5	80
<u>Total Suspended Particulates</u>			
24 Hour Maximum	112.0	294.0	150
Annual Geo. Mean	6.7	11.4	60
<u>Non-Methane Hydrocarbons</u>			
6-9 AM Maximum	263.0	163.0	160
Annual Arith. Mean	27.0	34.0	---

## B. Model Mitigations

To reduce the possible effects on moderate risk resources and issues, BLM proposes to select from the following model stipulations and procedural requirements before any future sale and in the permitting process. These model stipulations should be viewed as a formalization of present BLM authorities.

### 1. Model of Biological Conservation Stipulation

#### a. Minimum Requirements

The applicant for any permit from BLM will, at a minimum, identify all significant fish and wildlife use patterns within the vicinity of any proposed activity site. The applicant will submit this information as well as activity and site-specific plans which illustrate the measures adopted by the applicant to reduce possible impacts on fish and wildlife resources. This information, when analyzed in a NEPA compliance document, will serve as the basis for restricting facility siting and/or oil and gas activities and operations to protect significant fish and wildlife values.

#### b. Optional Requirements

The BLM, after consultation with BLM resource specialists, other regulatory agencies and/or the interested public informally or as a part of a NEPA compliance procedure, may require further applicant studies of local and/or regional fish and wildlife ecology and sensitivities before approving or disapproving any permit if these further studies are essential to a permitting decision in keeping with the total public interest.

#### c. Exceptions

The BLM may grant written exceptions available for public review upon request for specific activities or facility sitings when it can be shown by the applicant that such activities or facilities will not likely have a significant adverse effect on fish and wildlife resources or their preferred habitat. Exceptions will be granted only after an adequate written evaluation of the location, timing, intensity and density of the proposed operations as well as the anticipated cumulative effects of other user activities.

### 2. Models for Specific Permitting Requirements

The analyses undertaken before each lease sale or in a permitting process will choose specific stipulations similar to the following examples to ensure the conservation of moderate risk resources and issues.

#### a. Model of Stipulation for Moose Conservation

All activities and temporary or permanent structures within or adjacent to tall shrub riparian habitats along the central Colville River and its tributaries between the Oolamnagavik and Anaktuvuk Rivers or other areas discovered to be valuable to moose during a permitting process will be designed to minimize alteration, destruction or encroachment on riparian tall shrub habitats found within the flood plain. The following activities within

riparian tall shrub habitats will be approved only on a site-specific, case-by-case basis after careful consideration of all alternatives which may be less damaging to moose habitat and use. They are the establishment of: tractor train trails, landing strips, seismic lines, sand/gravel removal sites that may damage the habitat and permanent structures, and roads and pipelines that could block moose movement. For final permit approval, all activities and facilities within riparian tall shrub habitats important to moose must be designed to prevent restriction of moose movements in the area.

b. Model of Stipulation for Shorebird, Duck, Loon, Gull, Tern, Jaeger and Whistling Swan Conservation

All activities and structures on the Coastal Plain and shoreline of NPR-A will be designed to minimize alteration, destruction or encroachment on preferred habitats in various classes of wetlands. Permanent and temporary facility siting, surface entry, gravel/sand extraction, and fixed-wing aircraft flights below 500 vertical feet (150 m) within one-quarter mile (400 m) of preferred habitat during the snow-free season will be restricted if they are likely to have an adverse effect upon bird use or their preferred habitats during the snow-free season.

c. Model of Stipulation for Wolverine, Fox (Arctic and Red) and Wolf Conservation

The applicants will submit site and activity specific plans for: eliminating possible attractions to wolverine, fox and wolf, such as improper garbage disposal, feeding by workers or any other human/predator interaction; for protecting known or subsequently discovered densities, especially natal dens; and for protecting prey species. Further applicant studies of local wolverine, fox and/or wolf ecology and reaction to disturbance may be required before approving or disapproving any permit.

d. Model of Stipulation for Dall Sheep Conservation

The applicant for any permit for any activity within the Brooks Range physiographic province of NPR-A will generally avoid and protect any Dall sheep habitat of any kind including summer range, winter range, lambing areas, mineral licks and movement corridors within the vicinity of the activity site. If there is any Dall sheep use within two miles (3.2 km) of any activity site, the applicant will submit site and activity specific plans for eliminating parts of the activity that would alter, destroy or preclude use by Dall sheep.

e. Model of Standards for the Conservation of Soils, Air and Water Quality

The Draft EIS failed to fully consider the existence of presently applicable requirements for "Pollution/Erosion Control" (see Figure 20). After a trial and error process, these stipulations applied under Federal, State and local authorities have proved adequate to protect soils, air and water quality and to enforce remedial measures should accidents occur. In Alaska, the Alaska Department of Environmental Conservation has the lead role in enforcing air and water quality standards. There is no evidence that their enforcement of regulations on the NPR-A will not be adequate. Atmospheric emissions from any NPR-A operation must meet national standards. Water quality of natural aquatic systems will be protected through the application of proven regulations

governing: permissible levels of water withdrawal from under ice; discharge of drilling muds and cuttings to impermeable "mud pits" that can only discharge to natural waters by accidents or sabotage; reinjection of produced waters to subsurface stratas below the permafrost; restrictions on the storage of toxic materials and requirements for clean-up of all toxic materials as a part of the site rehabilitation process; and the requirement for each operator in NPR-A to have trained personnel, equipment and specific clean-up plans to immediately react to any spill of toxic material into the natural environment.

The Draft EIS proposed a model "Gravel Stipulation" (deleted in the Final EIS) that was limited in scope and directed towards prohibiting gravel removal from non-renewable sources, but it did not fully convey the regulatory mandates of BLM and other agencies to ensure that the mining of gravel and sand is performed in an environmentally sound manner from renewable or easily reclaimed sources. The Lessee for oil and gas on NPR-A has no implicit rights to any sand or gravel resources on NPR-A. The Lessee must negotiate with BLM under a "Mineral Material Contract" process (43 CFR 3600) to extract sand/gravel materials owned by the Federal government. The BLM, as a part of this contract, will design site-specific stipulation concerning permissible sites, seasons and methods of extraction as well as interim and final reclamation requirements. Most of the gravel deposits on NPR-A also come under the combined authorities of other Federal and State agencies mandated to protect the environment.

## CHAPTER FOUR. ENVIRONMENTAL CONSEQUENCES

### I. POSSIBLE IMPACTS TO HIGH RISK BIOLOGICAL RESOURCES LEASING

A comprehensive analysis provides, wherever possible, "would" statements as well and "could" (may happen) statements. "Would" statements are provided whenever:

- ° A credible case can be made that the described effect is likely; and
- ° The described effect would be significantly adverse.

The following discussions provide comprehensive analyses for the high risk biological resources of: caribou, grizzly bear, polar bear, geese, peregrine falcon, other raptors and fisheries. To aid in the analytical treatment for caribou and waterbirds, in May 1982 the BLM brought together two panels of scientists in the NPR-A Caribou/Waterbird Impact Analyses Workshop to estimate the adverse effects of oil development on these key resources. Much of the alternative-by-alternative qualitative impact analyses which follow is drawn directly from this workshop (Gilliam and Lent, 1982). It included two discussion groups, a Caribou Discussion Panel (CDP), and the Waterbird Discussion Panel (WDP).

As noted by commentors, the Draft EIS did not provide a proper preface concerning background assumptions or confidence levels in predictions within the comprehensive impact analyses for high risk biological resources. Therefore, the following background assumptions utilized for comprehensive impact analysis are provided:

- ° There are no areas of NPR-A deleted from the leasing program;
- ° There are no new special lease stipulations protecting fish and wildlife values in appropriate tracts; and
- ° Only site and activity specific mitigation stipulations would be applied in the permitting process with only cursory consideration of each permitted action to other existing or future permits (that is, no true consideration of regional significance).

Confidence levels in the comprehensive analyses in the Draft EIS should have been stated as:

- ° The BLM is confident that the qualitative analyses stemming from Gilliam and Lent (1982) represent likely impacts. There is a high confidence level for these predictions; and
- ° There is a low confidence level that the other comprehensive analyses represent likely impacts. These analyses are highly speculative and of the "worst-case" type. These analyses were constructed under CEQ guidelines to help the BLM to make better management decisions for the NPR-A.

A. Effects of the Standard Requirements Leasing Alternative

When read together, the habitat protections and restrictions throughout the NPR-A on worker activity resulting from implementation of the "standard" practices shown in Figure 20 plus specific "no surface occupancy" stipulations as a "standard" permitting practice would:

- ° Limit alteration of caribou habitat within or near any area of oil and gas development operations and reduce the frequency and duration of worker/caribou contact.

- ° Minimize interference with the wanderings of bull, yearling or barren cow caribou when traveling individually or in small groups allowing them at least the opportunity to habituate to non-threatening intrusions into their environment.

- ° Limit alteration of grizzly bear and polar bear habitats within or near any area of oil and gas development operations and reduce the frequency and duration of worker/bear contact.

- ° Generally reduce the impacts on geese that would result from most Coastal Plain developments to a level of unmeasurable regional significance and unmeasurable loss of the population level, although a catastrophic oil spill reaching the Teshekpuk Lake Goose Molting Area (TLGMA) or completely destroying large areas of coastal habitat for geese would result in significant impacts.

- ° Eliminate the impacts of oil development on peregrine falcon and reduce impacts to other raptors by assuring that no activities or facilities would be within one mile (1.6 km) of peregrine falcon nest sites, and strictly control habitat alteration in areas peregrine falcons use for hunting. (Other raptors sharing peregrine falcon habitat would be benefited by peregrine falcon protections).

- ° Substantially reduce environmental risks to subsistence fishery resources across the NPR-A through the application of: 200 meter setback requirements for all exploration, development or production activities; requirements of the general subsistence lease stipulation (see Figure 20); environmental safeguards of the geophysical exploration stipulations (no testing within one-quarter mile of fish overwintering areas); and the required Oil Spill Response and Clean-up Plan.

However, standard requirements leasing:

- ° Would not totally resolve the possible problems of stress, increased energy use, or delayed, deflected or blocked mass migrations of all caribou or alteration of the movements and habitat uses of pregnant cows or cows with calves. This is because there is no final indication that caribou could habituate, that is, become accustomed to disturbances. However, observation of caribou in the Prudhoe/Kuparuk area under present no hunting or harassment restrictions offers encouragement for habituations. If caribou do not habituate, then the development of fields and pipeline/haulroad corridors and associated high levels of human activity would act as an unnatural barrier to

## Figure 20 "STANDARD REQUIREMENTS" ALTERNATIVE

### 1. EXAMPLES OF LEASE STIPULATIONS FROM PREVIOUS NPR-A SALES

#### Geophysical Exploration

Prior to entry upon the lands for purposes of conducting geophysical operations, the Lessee will be required to obtain a geophysical exploration permit. This permit shall provide for such conditions, restrictions, and prohibitions as the BLM deems necessary or appropriate to mitigate reasonably foreseeable and significant adverse effects upon the surface resources. Upon promulgation of regulations governing the permitting of geophysical operations, those regulations shall apply to this lease and supersede the other provisions of this stipulation.

#### Environmental Training Program

In any Application for Permit to Drill submitted under 30 CFR 221, the Lessee shall include a proposed environmental training program for all personnel involved in exploration or development activities (including personnel of the Lessee's contractors and subcontractors) for review and approval by the BLM. The program shall be designed to inform each project employee of the specific types of environmental, social, and cultural concerns which may be involved in his job. The program shall be formulated and conducted by qualified instructors experienced in pertinent fields of study. They shall use methods to assure that personnel are instructed in recognition of and proper handling of archaeological, geological, and biological resources and the policy and techniques for non-harassment of wildlife resources. The program shall be designed to increase the sensitivity and understanding of personnel to local community values, customs, and lifestyles. Information on local subsistence activities should be included in order to minimize potential conflicts. The Lessee also shall submit for review and approval a technical environmental briefing program for supervisory and managerial personnel of the Lessee and its agents, contractors, and subcontractors.

#### Waterfowl

Exploration, drilling, and other development activities will not be allowed between May 20 to August 25 in order to protect important waterfowl nesting, molting, and staging habitat. The BLM may grant exceptions when it can be shown by the Lessee that activities will be conducted in such a manner as to have negligible adverse effects on waterfowl, or are not being conducted in proximity to important waterfowl habitat. These limitations will not apply to maintenance and operation of producing wells. Exceptions in any year must be specifically authorized in writing by BLM. Exceptions will be based upon an evaluation of location, timing, intensity, and density of proposed operations as well as the anticipated cumulative effects of multi-company activities.

#### Caribou

Exploration, drilling, and other development activities will not be allowed between May 15 and July 15 in an area used for caribou calving in order to protect important seasonal caribou calving habitat. No activities which would hinder normal caribou movements will be permitted. The BLM may grant exceptions when it can be shown by the Lessee that activities are not likely to have an adverse effect on calving or migrating caribou. Exceptions will be based upon the location, timing, intensity, and density of the proposed operations as well as the anticipated cumulative impacts of multi-company activities. These limitations will not apply to maintenance and operation of producing wells. Exceptions in any year must be specifically authorized in writing by BLM.

Exploration, drilling, and other development activities will not be allowed within active caribou migration routes between August 15 and September 15. No activities which would hinder normal caribou movements will be permitted. The BLM may grant exceptions when it can be shown by the Lessee that activities will not likely have an adverse effect upon caribou during post-calving migrations. Exceptions will be based upon an evaluation of the location, timing, intensity, and density of proposed operations as well as the anticipated cumulative impacts of multi-company activities. These limitations will not apply to maintenance and operation of producing wells. Exceptions in any year must be specifically authorized in writing by the BLM.

#### Peregrine Falcon

Exploration, drilling and other development activities will be limited as follows in order to protect important endangered raptor nesting sites:

- \* All construction and ground level activity will be prohibited within one mile of nesting sites from April 15 through August 31.
- \* Aircraft shall maintain 1500' altitude above the nest sites and one mile horizontal distance from nest sites from April 15 through August 31 unless doing so would endanger human life or safe flying practices.
- \* Proposed drill pads, permanent airstrips, camps, roads, or pipelines will not be permitted within one mile of any nesting site;
- \* Blasting or other significant construction noise within two miles of nest sites is prohibited between April 15 and August 31 unless specifically authorized by BLM after consultation with the U.S. Fish and Wildlife Service (FWS).

- \* Material sites, disposal sites, water reservoirs, drill pads, or other land uses that would significantly alter ponds, lakes, wetlands or shrub riparian habitat are prohibited within one mile of nest sites. Such activity within fifteen miles of identified peregrine falcon nest sites must be specifically authorized by BLM and the FWS and will be allowed only after a complete analysis of impacts to potential peregrine falcon hunting habitat.

Exceptions to these limitations in peregrine falcon hunting habitat hunting areas must be specifically authorized in writing by the BLM and the FWS.

#### Archaeology

Exploration and/or construction of drilling and other development activities will not be allowed in the vicinity of Larger Sway-back Lake, unless an exception is allowed by the BLM, to protect important archaeological resources.

Exceptions must be specifically authorized in writing by the BLM.

#### Subsistence Fishery

No activities, construction, or facilities will be authorized within 200 meters of Fish Creek unless the operator determines to the satisfaction of the BLM that such activities, construction or facilities will not interfere with continued subsistence use of Fish Creek.

#### Subsistence Lifestyle

The BLM may find that areas within the lease contain harvestable resources utilized by North Slope residents who have customarily and traditionally has a subsistence lifestyle. If such a finding is made, the BLM shall notify the Lessee in writing that the Lessee shall comply with the following requirements:

Prior to any drilling or construction or placement of any exploration or development structure on lease areas, including pipeline and facility placement, (hereafter referred to as "operation"), the Lessee shall gather site-specific information using field examination techniques approved by BLM.

(Subsistence Lifestyle cont'd)

The fields examination(s) shall identify, on all areas where operations will take place, the:

- \* active subsistence hunting, fishing, trapping or gathering sites;

- \* routes of access to the subsistence sites traditionally used by subsistence hunters, trappers, fishermen and gatherers;
- \* areas of high densities of harvestable resources; and
- \* wildlife migration routes of the harvestable resources within, from and onto the area of proposed operations.

If the site-specific information shows the harvestable subsistence resources may be adversely affected by any lease operations, the Lessee shall either:

- (1)(a) relocate the site of such operations to minimize adverse effects on the harvestable resources and/or
- (1)(b) relocate the site of such operations to avoid occupancy of any active subsistence site (including a buffer area of at least 200 meters around such subsistence sites) and/or
- (1)(c) conduct such operations and design production, processing, and transportation facilities to assure continued access of the subsistence user to the subsistence sites and to areas where the harvestable resources are of known high density; or
- (2) establish to the satisfaction of the BLM, after consultation with rural Alaskans who actively use the area for subsistence, that such operations will not have a significant adverse effect upon the harvestable resources, the subsistence sites, and/or subsistence users' access to the subsistence sites or harvestable resources.

### 2. EXAMPLES OF SITE SPECIFIC PERMIT STIPULATIONS OF BLM's FAIRBANKS DISTRICT OFFICE

#### Roads

Winter road or trail construction and use, involving heavy equipment, is to begin only after the seasonal frost in the tundra and in the underlying mineral soils over the route has reached a depth of 23 inches; and the average snow cover has reached a thickness of six inches. Normally this condition will not prevail until about October 25, occasionally not until November 1. These requirements may be modified by BLM for the use of light weight equipment specialized for use in tundra environments. Such modification, for specific uses, shall be in writing with a copy provided to the contractor or subcontractor. Winter road or trail use, involving heavy equipment, will cease when the daytime spring melt of snow begins. The approximate date of spring melt is May 5 in foothill areas exceeding 300 feet in elevation and approximately May 15 in the northern coastal areas. No bulldozing of tundra areas for roads or trails will be allowed.

#### Camps

Camps used for road construction will be situated on gravel bars, sand or other durable lands. Where leveling for trailers or modules is required and the surface

has a vegetative mat, leveling will be accomplished with blocking rather than by leveling with a bulldozer. Camps may be located on pond or lake ice which is determined to be frozen to the bottom provided that no sewage effluent, filtered waste water, toxic or hazardous materials, petroleum product or solid wastes are allowed to be dumped onto the ice. Such locations will be specifically approved in writing by the BLM with a copy of the approval provided to the contractor.

#### Tundra Travel-Over Snow

Exploration activities will employ low ground pressure vehicles of the Rolligon, ARDGO, Trackmaster, Modwell, Flextrac, or similar type. The limited use of tractors, equipped with wide snow tracks, will be allowed for the plowing of snow or to pull heavy camp equipment and drilling rigs. Blades may be used to plow unusually deep snow, but, when used, must be kept sufficiently high so that they do not "clip" the tops of tussocks or polygonal ridges. Experience has shown that such "guides" concentrate pressures on the tundra and tend to "clip" off tussock tops, especially in the drier tundra-type

areas. Any exceptions to this stipulation, which could result in damage to the tundra, will require the written approval of the BLM. Should true "ice" roads be used, their construction shall be sufficiently substantial for the specific use intended, that there is no breaking through the ice, by wheel or track, to the underlying tundra surface.

#### Operations Affecting Waterbodies

All operations shall be conducted in such a manner so as to not block any stream, or drainage system, or change the character or course of a stream, or cause the pollution or siltation of any stream or lake. Crossing of waterways shall be made using a low angle approach in order not to disrupt the naturally occurring stream or lake banks. There will be no bulldozing of stream or lake banks.

#### Protection of Fish and Wildlife

All operations shall be conducted in ways which minimize damage or disturbance of

any fish or wildlife resource. This includes, but is not limited to the following:

- \* No operations may occur within one-half mile of any denning barren ground grizzly (in the upland area) or of any denning polar bear (near the sea coast or in the lower reaches of major rivers or estuaries);
- \* No chasing of any wildlife by vehicle or buzzing by aircraft may occur. Particular attention will be given to avoiding disturbance of caribou.
- \* There will be no feeding of wildlife. Camps will be so managed that garbage is securely covered while waiting incineration.
- \* Hunting will be barred within a radius of five miles from a mobile construction camp, fuel cache, drilling operation, or road or trail under construction or use.

(Continued)



### 3. EXAMPLES OF OTHER STIPULATIONS

#### Submerged Land Stipulation (Adapted From Federal Beaufort Sea OCS Leases)

After completion of exploratory drilling, all structures will be removed from the leasehold. The Lessee will rehabilitate the site to a condition approved by the BLM unless a structure or site will be used in the production phase or for additional exploratory drilling or unless it is not in the best interest of the public or the environment to require removal or restoration. Permission to leave the structure in place must be obtained from the BLM.

Solid waste disposal on artificial islands or in waters of the lease area is prohibited. Discharge of produced waters and drilling muds and cuttings into the freshwater or marine environment is prohibited, except that the BLM may approve discharges if effluents are shown to be non-toxic and can be adequately dispersed.

Pipelines, including both flow lines and gathering lines for oil and gas, shall be designed and constructed to provide for adequate protection from water currents, storm and ice scouring, subfreezing conditions and other hazards as determined on a case-by-case basis.

If biological populations or habitats requiring additional protection are identified by the Land Manager on this tract, the BLM will require the Lessee to conduct environmental surveys to determine the extent and composition of biological populations or habitats and the effects of proposed or existing operations on the populations or habitats. The BLM shall provide written notice to the Lessee of this decision to require such surveys.

Based on any surveys which the BLM may require or on other information available to the BLM on special biological resources, the BLM may require Lessee to: 1) move any facility or operation so as not to adversely affect the resource; 2) establish to the satisfaction of the BLM, that operations will not have a significant adverse effect upon the resource; 3) operate during these periods of time that do not adversely affect the biological resources; and/or 4) modify operations to avoid adversely affecting the significant biological populations or habitats deserving protection. Data obtained in the course of such surveys shall be sent

to the BLM. Lessee may take no action that might affect the biologic populations or habitats surveyed until the BLM gives written directions to the Lessee concerning permissible actions.

Lessee's activities are subject to all Federally recognized coastal zone plans and ordinances.

#### BLM "Agency Wide" Requirements (Standard Stipulations)

##### Pollution/Erosion Control

The Lessee shall comply with all federally approved rules and regulations of the Secretary of Health and Human Services and the Environmental Protection Agency and State and local laws and codes governing the emission or discharge of pollutants from activities which are embraced in this lease or permit. Lessee shall comply with the rules and regulations of the lessor governing lands under lessor's jurisdiction which are embraced in the lease or permit. Surface disturbing activities may be prohibited during muddy and/or wet soil periods. This limitation does not apply to operation and maintenance of producing wells using authorized roads. During periods of adverse conditions due to climatic factors all activities creating irreparable impacts may be suspended.

##### Protection of Visual Quality

To maintain esthetic values, all surface-disturbing activities and facilities, including semipermanent and permanent facilities, may require special designs. Painting and camouflaging to blend the activity or facility with the natural surroundings and meet the intent of the visual quality objectives of the BLM may be required.

##### Habitat Preservation

The Lessee/operator is given notice that the lands within this lease may include special areas. Such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Any surface use or occupancy within such special areas will

be strictly controlled or, if absolutely necessary, excluded.

The Lessee will be required to submit plans of operations to the BLM. The BLM may make modifications to the plan of operations to protect special values and uses. Use or occupancy will be restricted only when the BLM demonstrates that the modification or restriction is necessary for the preservation of the special value or use.

##### Protection Given Those Holding Prior Existing Rights of Use

The Lessee will recognize existing uses and commitments in the form of grazing, timber cutting, and special use permits, water developments, ditch, road, trail, pipeline, telephone line, and fence right-of-ways and other similar improvements, and conduct his operations so as to interfere as little as possible with the rights and privileges granted by these permits or with other existing uses. The rights and privileges conveyed to the Lessee are subordinate to such uses whatsoever by the lessor.

Subsistence activities are according to an opinion of the Solicitor, Department of Interior, Alaska Region one of several public uses which have a continuing right of access to lands (including oil fields) within the lease. Stipulatory language protecting access for subsistence harvesters was adopted in Public Land Order 2740 (July 31, 1962). That language has been adapted to NPR-A oil activity as follows: "The rural residents of the North Slope shall have the right of ingress and egress and the right to use the leasehold in conducting their hunting, trapping, and related activities in

accordance with applicable law, provided, that such rights shall not be exercised in such manner as to endanger the safety of Lessee's employees or to damage Lessee's equipment or facilities."

##### Cultural Resources

Before undertaking any surface-disturbing activities on the leasehold, the Lessee or operator, unless notified to the contrary by the BLM shall:

- \* Engage the services of a qualified cultural resource specialist to conduct an intensive inventory for evidence of cultural resource values;
- \* Submit a cultural inventory report acceptable to the BLM; and
- \* Implement mitigations to preserve or avoid destruction of cultural resource values. Mitigation may include relocation of proposed facilities, testing and salvage or other protective measures. Where impacts cannot be mitigated to the satisfaction of the BLM, surface occupancy on that area must be prohibited.

The Lessee or operator shall immediately bring to the attention of the Authorized Officer any cultural resources or any other object of scientific interest discovered as a result of surface operations on this lease, and not disturb such discoveries until directed to proceed by BLM.

#### NOTE TO THE READER USE OF FIGURE 20 EXAMPLE STIPULATIONS IN THE FINAL EIS ALTERNATIVE LEASING PROGRAMS (CHAPTER FIVE)

**ALTERNATIVE A:** Only three Figure 20 example stipulations would be recommended as Special Lease Stipulations: Peregrine Falcon, Habitat Preservation and Cultural Resources. Other stipulations, similar to Figure 20 examples, could be applied in a permitting process on a site-specific basis if, in a joint review, the BLM and the petroleum industry agreed that they were required to mitigate reasonably foreseeable impacts and were not overly restrictive in either wording or interpretation.

**ALTERNATIVE B:** All Figure 20 examples would be attached to each lease form as Special Lease Stipulations. Additional stipulations would be developed and applied as Special Lease Stipulations and as site-specific permitting stipulations to minimize all potential impacts.

**ALTERNATIVE C (the Preferred Alternative):** These Figure 20 examples or similar stipulations would be applied to *specific* sale tracts as Special Lease Stipulations or to *specific* permitting actions, as appropriate to mitigate *likely* impacts. This would be consistent with the first two NPR-A lease sales and resulting permitting actions.

the mass migrations of caribou. This especially would affect the movements of pregnant cows and cows with calves during pre- and post-calving migration. Caribou would suffer physiological energy depleting avoidance responses to unexpected human intrusions such as low altitude aircraft operations.

- ° Would not ensure that all grizzly bear denning habitat and home ranges influenced by the area of operations would be properly identified and all potential conflicts would be mitigated to avoid bear disturbance or attraction to the area of operations.

- ° Would not ensure that all polar bear onshore maternity denning habitat and polar bear access routes influenced by the area of operations would be properly identified. Neither would all potential conflicts be mitigated to avoid bear disturbance or attraction to the area of operations.

- ° Would not be effective in at least a portion of the area to the north and east of Teshekpuk Lake commonly referred to as the TLGMA (Gilliam and Lent, 1982).

- ° Would not be effective in protecting peregrine falcon and other raptors from indirect impacts of development triggered by the increased public access implied by new roads and airports in the Arctic.

- ° Would not totally eliminate the effects on fisheries from: fisheries habitat alterations at road and pipeline crossings of streams; the environmental risk of accidental or sabotage-related spills of petroleum products into waterbodies; and potential presence of development facilities adjacent to traditional subsistence fishing sites.

#### 1. No Surface Occupancy

Restrictions on surface occupancy are a part of the Standard Requirements Leasing Alternative. These types of restrictions are usually applied in a permitting process for two primary reasons:

- ° Valid site-specific studies confirm the presence of high value fish and wildlife use in a limited area. These fish and wildlife uses are known to be incompatible with the proposed activity. The known resulting environmental loss from occupancy of the site by the proposed activity precludes permitting the action; or

- ° Nonspecific studies indicate there may be a high value fish and wildlife use in an area. Although it is not exactly known if the proposed action would disturb these uses, surface occupancy is prohibited over large areas to protect potential environmental losses.

The first use of this restriction is the proper usage BLM intends to apply. The second use of this restriction is more common and often is applied to the wrong areas. The second usage is often encouraged by a Permittee's submittal of nonspecific plans, area descriptions and impacts analyses for their proposed activity. The following analyses of restricted surface occupancy are provided to determine if their proper use would meaningfully reduce impacts.

° Caribou: Surface occupancy leasing restrictions on most of the Reserve would have only limited benefit to caribou which utilize all of NPR-A as habitat because only a few habitual site-specific uses have been identified. This restriction is viable when discussing leases that lie in the pathway of major caribou migrations such as passes through the Brooks Range, traditional river crossings, or within traditional calving areas. Selective use of this restriction would alleviate many potential barriers to migration. Indiscriminate application of this alternative without proper studies indicating whether it would be effective in the long term may prove detrimental to caribou use by allowing facilities to be built in the "wrong" areas while protecting marginally valuable areas. It could also be detrimental to orderly and controlled petroleum development.

° Grizzly Bear: As with caribou, indiscriminate application of no surface occupancy clauses in permits to "cover-up" inadequate site and project specific baseline information in the long term may become counterproductive to effective grizzly bear management. With respect to grizzly bear, no surface occupancy clauses would probably be both site- and seasonally specific. Their effectiveness would be directly proportional to the adequacy of the baseline information gathered prior to the activity and facility siting permitting process. Application of no surface occupancy clauses within a permit to protect heavily used feeding or denning areas would reduce the chance of worker/bear confrontations.

° Polar Bear: No surface occupancy clauses would not be an effective alternative without a better definition of traditional polar bear access routes and denning areas. However, if combined with the knowledge required under the design solution concept, it may provide optimum protection if studies can define the basic compatibility level between development and polar bears.

° Peregrine Falcon: A lease stipulation protecting existing NPR-A peregrine falcon nest sites is a standard BLM practice. The lease stipulation shown on Figure 20 as "Peregrine Falcon" is a direct result of a formal consultation concerning NPR-A oil and gas leasing with the U.S. Fish and Wildlife Service (FWS) pursuant to Section 7 of the Endangered Species Act of 1973 (as amended). The BLM intends to enforce these stipulations as applicable to all NPR-A oil and gas leases and to continue the required consultations with FWS on any proposed NPR-A project. No surface occupancy within one mile (1.6 km) of nest sites and essentially no temporary surface occupancy within two miles (3.2 km) of a nest site from April 15 through August 31 is required. It may be prudent to avoid future permanent facility siting problems by generally applying the one-mile surface occupancy restriction as a buffer zone during the permitting process for permanent facilities. Therefore, a one-mile buffer zone would be established for each bluff or cliff with active historic or potential nest sites. This would allow for nest sites to change their particular cliff face location without retroactively requiring alterations in a Permittee's facilities or operations.

° Other Raptors: It appears that other cliff-nesting raptors as well as the peregrine falcon would benefit from at least a minimal no surface occupancy clause if it were to be generally placed on all cliffs or bluffs providing raptor habitat. Not all historic peregrine falcon or other raptor nest sites are known. Therefore, it appears prudent to designate a flexible one mile no surface occupancy zone on each cliff in NPR-A suitable for raptor nesting.

° Geese: Protection of coastal areas providing known critical seasonal goose habitat with surface occupancy restrictions may help ensure that developments located in other areas of the Reserve will not result in significant impacts. It must be stressed that application of surface occupancy restrictions may be interpreted as prohibiting all mining of sand and/or gravel from islands, spits, coastlines or other areas that provide goose or other waterbird habitat.

° Fisheries: No surface occupancy restrictions if applied to limited areas of known importance during a permitting process may be very effective in preserving the resource base for subsistence use. Surface occupancy restrictions would be appropriate to preserve use of traditional subsistence fishing sites but also may be appropriately applied to conserve the quality of habitats located great distances from an actual fishing site. If site-specific surveys during the permitting process reveal spawning, rearing or overwintering sites important to distant subsistence fishing success, they must be conserved.

## 2. Comprehensive Analyses for Caribou

Impacts on caribou habitat would result from any permanent development within the NPR-A. Whether the impact would be significant or even measurable in terms of effect on herd size would depend on the location of the development in relation to caribou use patterns and the as yet undetermined ability of the caribou to eventually habituate (that is, to accommodate disturbance). Industrial developments within a calving area would almost certainly produce significant observable effects (Gilliam and Lent, 1982) while development at the edges of summer range may have only minor impacts that would not be measurable in terms of herd size. However, any NPR-A development would produce some level of residual change on caribou habitat or access.

In May 1982, the BLM-sponsored NPR-A Caribou Discussion Panel (CDP) met to consider the possible impacts on the Western Arctic Herd (WAH), the Teshekpuk Lake Herd (TLH) and the Central Arctic Herd (CAH) from hypothetical oil developments within NPR-A. The CDP qualitatively predicted expected impacts based on several hypothetical cases of development similar to those shown in Figures 15 through 18. These broad qualitative predictions about relative types and risks of impacts (Gilliam and Lent, 1982) are interwoven into this caribou impact analysis. However, the CDP could not quantify impacts or predict changes in the population demographics and distribution of the WAH, TLH and/or CAH based on the present understanding of caribou reaction to development.

The following discussions present qualitative and quantitative impact predictions, but only the qualitative predictions are backed by the CDP conclusions. The quantitative impact predictions have been constructed by the EIS team solely for this EIS.

Commentors on the Draft EIS criticized the quantitative predictions given in the "Comprehensive Analysis for Caribou" as inconsistent with the literature. That is, the quantitative analysis, constructed solely for the purposes of this EIS, presented an unreasonable and unsupportable "worst" case analysis. A basic change in simplifying assumptions has been made in response to these comments. No attempt will be made to give "precise" demographic or population change predictions as was done in the Draft EIS. Quantitative analyses for caribou in the Final EIS will be limited to identifying possible quantitative effects. This will make the Final EIS consistent with the most recent literature (Banfield, Jakimchuk and Cameron, 1981; Gilliam and Lent, 1982;

Truett, Howard and Johnson, 1982) which has been unable to identify or predict specific changes in population levels despite reported observations of changes in caribou behavior when confronted by industrial activities.

Simplifying Assumptions for Caribou Analytical Cases 1-4

- ° Pregnant cows or cows with calves may or may not cross or inhabit (may or may not habituate to) any NPR-A development field or haulroad/pipeline corridor. Bulls, yearlings, barren cows when not moving with pregnant cows or cows with calves will cross the corridor when human activity levels are low and will inhabit the edges of developed areas in small groups to obtain browse or insect relief.

- ° All NPR-A haulroad/pipeline corridors will be built and managed similar to the Trans Alaska Pipeline System (TAPS) and Dalton Highway. That is, it is assumed that: the haulroad may be public; there will be no traffic level restrictions; there will be no sport hunting within five miles (8 km) of either side of the road and the pipeline; and, as with TAPS, there will be special crossing structures for caribou at certain intervals.

The two simplifying assumptions of this EIS lead to two general impact predictions:

- ° Any disruption in the movement patterns of pregnant cows or cows with young calves may lead to increased calf mortality; and

- ° Any disruption in the movement patterns of pregnant cows or cows with young calves as observed along the TAPS corridor may lead to alterations in use of the total NPR-A caribou range, not only by pregnant cows or cows with calves, but also by other segments of the herd which move with them (bulls, yearlings, and barren cows).

If pregnant cows and, later in summer, cows with young calves continue to avoid the human activities, the road traffic and the limited crossing structures provided in a TAPS design haulroad/pipeline in NPR-A, increased calf mortality may be observable. Disruptions caused by industrial activities, even those without total blockages to movement, may cause delays in or deflection of pre-calving migration that could cause calves to be born in less than optimal locations. Disruptions also may cause increased post-calving exposure of young calves to predation and may result in lowered nutritional intake, decreased growth and poorer calf survival. However, it is not known if any increased calf mortality rate necessarily will lead to significant changes in the "normal" population level cycling observed among WAH caribou.

If NPR-A developments, haulroads and pipelines are designed, constructed and managed as are the Prudhoe Bay/Kuparuk fields, Dalton Highway and TAPS, there may be changes in present caribou distribution on NPR-A. The no hunting restrictions within five miles (8 km) of a haulroad/pipeline corridor would be a positive protection to maintenance of caribou population levels, as the increased road access would not lead to increased sport hunting take. However, if traffic levels on the haulroad are not controlled and pipeline crossing structures are placed without consideration for where caribou will

use them, the rate of crossing success will be influenced as has been observed along the TAPS. Consequently, NPR-A ranges may become more difficult to access. Any changes in present caribou distribution patterns on and adjacent to NPR-A are of much greater significance than potential increases in calf mortality. Even if present caribou population levels are maintained, if the caribou no longer come within the traditional subsistence hunting areas, the subsistence lifestyle may be threatened.

a. Colville River Developments (Analytical Case 1)

The CDP and EIS team analyzed the effects of fields along the Colville River between Umiat and Jubilee Creek in the Colville River headwaters (see Figure 15).

Qualitative Analysis For Case 1  
(from Gilliam and Lent, 1982)

The CDP conclusions are:

...the habitats included in two hypothetical fields, Liberator and Prince Creek, were identified as habitats receiving primarily short-term caribou use during periods of rapid seasonal movement. The direct loss of habitat due to displacement or decreased use of the fields themselves was considered insignificant....

The probability that the... (road/pipeline) corridor would be a potential barrier, to caribou movements is greatest during the pre-calving movement.... There is a 90 percent probability that 20 percent or more of the entire WAH population including 50 percent or more of the adult females, would encounter the corridor at this time in a given year.

The nearer the encounter occurred to the peak of the calving period... the more likely pregnant cows were to act in a highly sensitized fashion, as if they were cows with calves.

After the post-calving aggregations... roughly 50 percent of the population, would be expected to encounter the long east-west segment of the corridor....

Of all encounters, those associated with post-calving are viewed as most likely to have significant adverse impacts....

Quantitative Analysis for Case 1  
(constructed by EIS Team)

Summary of hypothetical impacts for Analytical Case 1.

- ° Disruption of the demographics of the WAH could occur due to increased mortality of calves.

- ° Pregnant cows, cows with calves and other members of the WAH and CAH herds which normally move with them may decrease their use of ranges and migration pathways east of Howard Pass and south of the hypothetical corridor shown in Figure 15. Unless special restrictions designate permissible levels

of traffic on haulroads and on pipeline design to improve caribou crossing success, the availability of caribou to subsistence users in Anaktuvuk Pass may be reduced.

#### Discussion for Analytical Case 1

The Analytical Case 1 analysis predicts that the demographics of the WAH may be adversely affected. While population numbers may not be measurably altered in the short-term, the long-term reproductive potential of the herd may be lowered by any increase in the mortality rate of calves. Pregnant cows and cows with calves may adapt to the intrusion of development by at least partial abandonment of range east of a line drawn from Howard Pass to the hypothetical Liberator Field and south of the hypothetical corridor.

Possible desertion of a portion of the traditional range by pregnant cows and cows with calves and other caribou which move with them is more significant than a possible alteration of WAH demographics by increased calf mortality. This could prevent the WAH from achieving its highest potential population because the habitat available could become a limiting factor much sooner. There is a high probability that the pregnant cows and cows with calves of the CAH also could desert the portion of their range to the south of the Umiat to TAPS corridor. This would have serious effects on subsistence harvesters in Anaktuvuk Pass.

Several events could occur to change the significance of these potential impacts. Herd management measures may be able to prevent this scenario from resulting in a change in demographics. Greater numbers of caribou could become resident on the Coastal Plain moving to and from the calving grounds without approaching the corridor. The State could restrict hunting to bulls which might negate any increase in calf mortality. Finally, the caribou may habituate to NPR-A developments.

#### b. Teshekpuk Lake Development (Analytical Case 2)

The CDP and EIS team analyzed the effects of fields surrounding Teshekpuk Lake (see Figure 16).

#### Qualitative Analysis for Case 2 (from Gilliam and Lent, 1982)

The CDP conclusions are:

For the Western Arctic Herd, developments in the Coastal Plain of NPR-A... would have relatively little impact.... There is no evidence that winter range here is limited and should not present a problem even if access was significantly reduced.

...a field in the vicinity of the Smith River location would...(be in) ...as much as 20 percent of the calving area of the Teshekpuk Lake Herd. This compares with about five percent of the calving area of the Central Arctic Herd... occupied by... oil field developments.

The overlap of seasonal TLH ranges...could mean that habituation would be more likely or it could lead to more drastic impacts because of simultaneous effects at more than one point in their annual cycle.

Because the movements of this herd center around the lake, there is an unusual potential for disruption of movement patterns.

Quantitative Analysis for Case 2  
(constructed by EIS Team)

Summary of hypothetical impacts for Analytical Case 2:

- ° WAH - There may be loss of access to an insignificant portion of winter range. (The amount of winter range presently is not considered limiting to WAH). Loss of access to habitats offering relief from insects on a portion of the coast may also have an unmeasurable significance unless the access is also limited in other NPR-A coastal areas.
- ° TLH - There may be loss of herd identity by merging and moving with the WAH accompanying an abandonment of caribou habitat around Teshekpuk Lake. This loss of TLH identity could be significant to scientists and subsistence hunters but probably insignificant to maintenance of total Arctic caribou population levels.
- ° CAH - The extension of the present Prudhoe Bay - Kuparuk haulroad into NPR-A may become significant. The CAH's pregnant cows and cows with calves may find access to the area north of this road, including the CAH's main calving area, more difficult than at present.

Discussion for Analytical Case 2

The identity of the TLH with its 4,000 - 5,000 members only has been recognized by biologists in the last four to five years, although residents of the North Slope Borough long have known of a resident population in the Teshekpuk Lake area. It appears that year-round residency of caribou in this area may be some type of adaptation by a few caribou during the low point of the WAH's population level in the 1970's. As the WAH population level continues to expand from the 1982 estimated population of 180,000, its overwintering members on the Coastal Plain may either increase the size of the TLH if a separate calving ground is maintained, or encompass the TLH if all calving in the Teshekpuk Lake area stops.

This analysis assumes that caribou cannot tolerate more than peripheral occupation of a calving grounds. An oil field near Smith River would occupy about 20 percent of the recently used calving grounds of the TLH. When considering the CAH's highly sensitized behavior to the five percent of their calving ground to the east occupied by oil development, the TLH caribou may simply abandon the disturbance area and join the WAH Coastal Plain wintering population and shift calving to the northern portions of the Utukok Uplands. Some caribou use of the edges of fields and corridors would be evident in all seasons, but the identity of the TLH could be lost.

The development of a haulroad/pipeline corridor connecting the Prudhoe Bay - Kuparuk developments to northeastern NPR-A may have several adverse impacts on the CAH. Present CAH access to their core calving area north of the Kuparuk field may be changed by the establishment of a NPR-A haulroad with heavy traffic levels. Establishment of a new calving area in a less than optimal habitat south of the traditional calving area north of the Kuparuk field is a



possibility. Access to areas providing relief from insects along the Beaufort Sea coast north of the Kuparuk field may be altered. A coastal road/pipeline corridor already planned from Prudhoe Bay to Duck Island to the east of the Prudhoe Bay complex may restrict access to the coast for insect relief to the east of TAPS. A Kuparuk road extension to NPR-A may compound this impact by decreasing coastal access west of the TAPS. There is a slight possibility that CAH herd identity could be lost to the WAH or Porcupine Herd with only a few individuals using the old CAH range.

c. Utukok River Area Development (Analytical Case 3)

The CDP and EIS team looked at fields in the Utukok River area, including a pipeline to TAPS (Figure 17).

Qualitative Analysis for Case 3  
(from Gilliam and Lent, 1982)

The CDP conclusions are:

(This combination) has an east-west corridor dividing NPR-A, as well as the range of the WAH, into two portions.

Roughly 150 square miles (388 sq km) of the 1,100 square mile (2850 sq km) core calving area would be subject to occupancy by development that would at least partially displace some caribou that normally use it....

There is a probability greater than 90 percent that most adult cows in the WAH population would be in or encounter the fields at least once immediately, before, during or after calving. Overall, the effect will alter the movements and distribution of cows and associated caribou over the calving grounds....

Effects on individual cows entering and persisting in using calving habitat within a field would:

1. Still be able to locate optimum forage, unless she was prevented from leaving the field at the optimum time after calving;
2. Be subject to levels of disturbance above normal "background" levels;
3. Spend less than a "typical" proportion of time feeding;
4. Find localized movements restricted and time consuming;
5. Be subject to traffic and other accidental forms of mortality at above-normal levels;
6. Be more likely to abandon or be separated from her neonate calf than normal; and
7. Be subject to somewhat less-than-normal chances for predation-related mortality.

Cows displaced or deflected by a field and that moved to other areas to calve would be placed in a less than optimum calving environment.

These encounters could involve thousands of cows with calves under one week old, an age when their capability to negotiate barriers, relocate their mothers and recognize potentially dangerous objects or situations is still extremely limited.

There is the distinct possibility that the fields and corridor could cause a split within the present WAH with coastal wintering cows staying north and east, and the southern wintering ones staying south and east of the corridor. The long-term consequences of such an event are highly unpredictable, but the movements and identity of the herd could be altered.

The panel agreed that the calving period was the time in the annual cycle when habituation by cows to disturbing stimuli was least likely to occur.

A cow could encounter various developed areas and potential barriers seven or eight times in a year. The majority of these encounters would be during the calving, post-calving and summer periods considered most sensitive.

Quantitative Analysis for Case 3  
(constructed by EIS Team)

Summary of hypothetical impacts for Analytical Case 3.

- ° The WAH could split into two herds:
- 1. A northern WAH (NWAH) could reside year-round on the NPR-A Coastal Plain and in the Northern Foothills. The initial population size could be approximately 40 percent or less of the old WAH. Low predation rates, variable hunting pressure and use of the same habitat year-round could make this NWAH highly susceptible to a "boom and bust" cycle of overpopulation and overuse of habitat. This could lead to a population crash and slow regrowth with many ramifications for coastal subsistence hunters. Calving for this herd could center in the northern part of the Utukok calving area. Interchange of individuals with the southern WAH could still be possible during the calving period.
- 2. A southern WAH (SWAH) could remain migratory but as indicated in Analytical Case 1, the portion of the range east of Howard Pass and south of the corridor could be at least partially abandoned by pregnant cows and cows with calves and other herd individuals associated with them. Initial population size of the SWAH could be approximately 60 percent or more of the old WAH. High predation rates by wolf packs protected by the establishment of National Park Service lands on the south side of the Brooks Range could be evident. The change in the geographic distribution by abandonment of the eastern NPR-A habitats, changes in subsistence hunting availability and loss of use of portions of calving area and summer range in NPR-A could reduce the maximum obtainable population for this herd. Because of the multitude of factors influencing the size of the SWAH, it could stabilize after several years at a much lower level than that of the old WAH.

3. Overall, the combined populations of the NWAH and SWAH may never reach the maximum potential of an unrestricted WAH. Intensive game management of the sedentary NWAH may be necessary to prevent initiation of a "boom and bust" cycle. However, due to the migratory nature of the SWAH, intensive game management might have little success in maintaining the size of the SWAH.

° The TLH could sustain a loss of herd identity by merging with the NWAH. The calving area north of Teshekpuk Lake could remain in use.

#### Discussion for Analytical Case 3

Fields within the Utukok Uplands could produce the most significant impacts on caribou populations on or adjacent to NPR-A. The CDP made no quantitative predictions of impacts but determined that an east-west corridor dividing the Reserve into north and south ranges could result in a change in WAH distribution and identity.

Splitting the WAH into two smaller segments that with combined populations could never equal the population potential of an unrestricted WAH is one logical outcome of Analytical Case 3. Presently, up to 40 percent of the WAH overwinters on the Coastal Plain. It is assumed that the starting populations of the NWAH would be 40 percent of the existing population WAH. The SWAH would be 60 percent of the then current WAH population.

In the case of the NWAH, absence of predation by wolf packs and grizzly bears could result in a rapid herd growth. The NWAH, which would not be exposed to long energy-consuming migrations, could outstrip the ability of the Coastal Plain to support an increasing population. Eventually, a population crash could result. Recovery from the reduced population and overuse of available habitat could be aggravated by recruitment from the SWAH following calving when both herds could calve in the Utukok Uplands separated by the Avingak/Utukok hypothetical development field and corridor. This recruitment from the SWAH could slow the NWAH's stabilization due to continued overuse of habitat.

The SWAH caribou could be subjected to a higher percentage of predation by wolf and grizzly bear because the SWAH would always be within range of these two predators. Grizzly bears never have been considered a prime predator on the WAH. However, restriction of the SWAH to the southern part of the "core calving area" on NPR-A would make a great deal of them available as prey, including neonatal calves, in the most densely inhabited grizzly bear range on the Arctic Slope.

The SWAH could not readily move away from bear predation without the accompanying loss of use of optimum calving area and calving success. Abandonment of the more easterly portions of the traditional WAH winter and migratory habitat could result from the development of Liberator Field and the east-west corridor as discussed in Analytical Case 1. Overall, the SWAH probably could stabilize at a level below the carrying capacity of the available range.

The TLH probably could be expanded by the NWAH or lose its identity to the NWAH under this hypothetical case. Overuse of the present TLH habitat by expanding the number of resident caribou on the Coastal Plain is a possibility.

This type of habitat overuse could make calving north of Teshekpuk Lake untenable with a shift of all calving for Coastal Plain resident caribou to the northern Utukok Uplands.

The impacts experienced by the CAH would be as described for Analytical Case 1.

d. Western NPR-A Discoveries (Analytical Case 4)

The CDP and EIS team reviewed the effects of a road and pipeline going west to the vicinity of Cape Thompson from a series of fields in the Utukok Uplands, the upper Colville River drainage and near Peard Bay (Figure 18).

Qualitative Analysis for Case 4  
(from Gilliam and Lent, 1982)

The CDP conclusions are:

Fields ...developed in the calving grounds ...were determined to involve extremely high risk of unacceptable environmental impacts....

The impacts on the caribou population resulting from corridor effects in this case are relatively minor compared to the field impacts. However, the western corridor may influence herd behavior in such a way as to decrease availability for subsistence use in villages such as Point Hope, Wainwright and Kivalina.

Quantitative Analysis for Case 4  
(constructed by EIS team)

Summary of hypothetical impacts for Analytical Case 4.

° A decline in the presently attainable WAH population could result from abandonment of range to the north and west of the corridor and especially the presence of oil fields in the calving area. A split in the use of the calving area could occur with the majority of cows using Brooks Range passes to the east of Howard Pass to reach what could be the new main calving area to the north and east of the present core calving area. Establishment of new satellite calving areas could occur to the southwest of the corridor and in previously used areas in the vicinity of the Meade and Awuna Rivers headwaters. Elimination of the westerly post-calving movements observed in some years could occur. Fall migration and the return to wintering grounds could be almost exclusively via Howard Pass or more easterly passes. Because of the split in availability of calving grounds, there could be an increased tendency for some of the WAH to remain on the Coastal Plain in winter.

° There would be little effect on the TLH other than increased recruitment to and from the Coastal Plain wintering segment of the WAH.

° There would be no measurable effect on the CAH.

Discussion for Analytical Case 4

Loss of caribou calving habitat and access to areas west and north of the corridor could result in a corresponding decrease in the maximum attainable

WAH size. Effective exclusion of caribou from post-calving habitat southwest of the calving grounds could greatly reduce caribou availability for subsistence users in Wainwright, Point Hope and Kivalina. The season of availability to villages in the lower Noatak and Kobuk drainages could be changed by a tendency for the WAH to migrate through Howard Pass or other more easterly passes.

There is a distinct possibility that some increase in the mortality of calves could occur due to occupation of the calving grounds. Total population level changes may not be measurable in the short-term but disruptions in WAH demographics could have long-term effects on overall optimum size for the herd.

The shift in accessibility of portions of the calving grounds could have profound influences on WAH distribution. The area to the north of the Avingak/Utukok fields is the logical successor to the "original" core calving area as it represents the largest and most accessible remnant of this habitat type.

The bulk of WAH caribou could probably calve here at a high population density rate because caribou would be effectively protected from wolf or grizzly predation by the predators' sensitivity to human activities to the south.

Ease of access to this area could influence a large proportion of the WAH to remain on NPR-A during winter thereby reducing the availability to subsistence users outside of NPR-A.

Cows from the WAH that wintered south of the Brooks Range could use less than optimal areas for calving due to the long avoidance distance that would have to be traveled to reach the remanent core calving area to the north and east of the corridor and fields. Calving in less than optimal areas could result in less than optimal calf survival. Predation by wolves and grizzly bears could be a factor in overall cow/calf survival rates. If the same WAH animals utilize these areas for calving every year, the demographics of these populations may be altered from the optimal sex and age class ratios. The long-term effects on overall WAH productivity could lead to an unmeasurable or slight long-term decline in the presently "naturally" attainable population.

### 3. Comprehensive Analysis of Grizzly Bear

A report by Reynolds (1979) and the NPR-A 105(c) Land Use Study, "Values and Resource Analysis" Vol. 3, Section 6 (USDI, NPR-A Task Force, 1978) contain the best summaries of NPR-A's grizzly bear resources and sensitivities.

Reynolds says: "The history of brown/grizzly bears (Ursus arctos L.) has been one of continuous reduction of numbers and range coinciding with human population growth and development."

The NPR-A 105(c) Land Use Study reached the same conclusion:

The best use of the present grizzly bear habitat would be to maintain it in its present status. This can be best achieved by prohibiting any land uses in the major river valleys that would destroy the feeding habitat or restrict grizzly movement between drainages when in search of food. Land uses that would disturb denning grizzly bears or destroy denning areas would also be in conflict with best use. Concentration of people and

solid wastes in areas of bear use is especially to be avoided. Such concentrations often form "attractive nuisances" and result in habituated bears that are shot or removed because of human-bear conflicts (Milke, 1977). Historically, grizzly bear populations, especially when associated with open terrain, have been reduced or extirpated wherever increased human populations or developments have occurred. Because of inevitable human/bear encounters, development in an area effectively excludes normal bear use and will result in reduced overall numbers.

Reynolds concluded that enclaves for grizzly bear protection should be set aside:

The greatest potential human impact on maintenance of grizzly bear populations is that of large-scale development and human habitation. Because grizzlies in NPR-A travel widely and have large home ranges, maintenance of enclaves of intact habitat is important; these should be at least as extensive as the 2,000-mi<sup>2</sup> (5,000-km<sup>2</sup>) study area.

The study area mentioned is in southwestern NPR-A (see Figure 8 Utukok Uplands). The 105(c) Land Use Study strengthens this proposal:

Bears in the high density area of the Upper Utukok drainage referred to above are particularly vulnerable to both harassment and hunting. In turn, this area may be a center of productivity providing bears through egress to other areas. Thus, special management will be required for this area if human use of the area increases.

Reynolds (1979) further concluded it would be crucial that winter dens be identified and protected:

Although human disturbance associated with gas or oil development may occur throughout the year, disturbance during the winter when grizzlies undergo long periods of winter dormancy would likely have the most serious effects. During late spring, summer and early fall, bears are mobile and can usually escape sources of disturbance but during the period of winter denning, disturbance which was serious enough to cause bears to leave dens could result in poor physical condition or death. Also, since female grizzlies give birth in winter dens, disturbance could cause abandonment of dens, resulting in the death of young exposed to winter temperatures.

...observations of other den sites near seismic lines indicate that no bears abandoned dens because of seismic explosions; however, bears were disturbed enough to shift their position inside the dens. While such disturbance would not be detrimental to the majority of bears, agitation and disturbance of females with newborn cubs could result in the death of the young; the possibility is not likely, but it could occur, especially with females which are very sensitive to disturbance.

While present BLM stipulations call for: "No seismic shooting or vehicle operations within one-half mile of any denning barren ground grizzly," they do not include any specific requirement to locate any dens other than those already known to BLM. While this stipulation may have been sufficient for NPR-A petroleum exploratory activities, it may not be sufficient for the more

intense NPR-A oil activities expected if fields are developed. No special concentration areas for denning were found in studies of the grizzly bear in southwestern NPR-A (Reynolds, 1979). Therefore, without required intensive site-specific surveys before an activity takes place, it may be impossible to attempt to minimize impacts from nearby activities.

Experience from developments elsewhere in Alaska has shown that two other issues are of paramount importance: intentional or inadvertent harassment of bears and maintenance of "attractive nuisances" such as feeding of bears by workers and by improper garbage disposal. Aggressive bears or bears which show no fear of man may result. These bears must be removed or shot in the interest of public safety.

Every Arctic development has restrictions on human/bear interactions, but enforcement to date has been lax. Milke (1977) provides the best general case study and the best suggestions for regulations stressing enforcement.

Oilfields in the Foothills of NPR-A (see Figures 15 through 17) have been chosen for comprehensive analysis. These cases intersect the highest known densities of grizzly bears on NPR-A. Developments outside the Foothills and Brooks Range physiographic provinces of NPR-A are not expected to result in any measurable reductions in grizzly bear numbers due to their low distribution density (one per 300 square miles or one per 777 sq km). Coastal Plain development encounters and conflicts with grizzly bears are expected to be so infrequent that case-by-case circumstances would be adequate to determine proper mitigations.

However, developments in all areas of NPR-A may attract grizzly bears that wander into an activity area while feeding or when curious about the smells of garbage receiving improper handling and disposal. Worker/bear encounters as a result of photographing or feeding these animals may result in bears that must be removed or destroyed in the interest of public safety.

#### Summary of Hypothetical Grizzly Impacts

In a conservative impact modeling, a permanent loss of up to 15 percent of NPR-A's sustainable grizzly bear population due to displacement from preferred habitat and of individuals to ensure public safety could result over the 35-year life of a model. Potential impacts may be much greater. New individuals will continually move into any vacant territories resulting from destruction of human habituated bears and maintain the cycle of human/bear conflicts.

#### Discussion of Comprehensive Analysis

The 400 to 450 grizzly bears estimated to be resident on NPR-A represent a resource that would be slow to recover from a sustained population loss. Loss of individual bears in relationship to oil and gas development could take at least two forms:

- ° Displacement of bears from a habitat in an area already at carrying capacity effectively ensures the death of some bears via intraspecies competition for resources in adjacent habitats; and

° Worker confrontation with hostile bears often leads to destruction of the bear to ensure public safety.

It is assumed that there would be no increase in legal or illegal hunting over the present level and that bears would not be reluctant to pass through oil field and corridor facilities.

It is also assumed that NPR-A's grizzly bear habitat is at carrying capacity and that there is a direct relationship between the amount of surface encompassed by fields and the number of grizzly bears that would be lethally displaced. This relationship can be expressed as:

Area(s) of Altered Habitat (Multiplied by) Average Grizzly Bear Density

Using this equation, the estimated permanent loss of population due to field developments is estimated to be:

Avingak Field = 60 square miles X .05 bear per square mile = 3 bears  
Utukok Field = 80 square miles X .05 bear per square mile = 4 bears  
Liberator Field = 80 sq. mi. X  $\frac{.029 + .02}{2}$  bear per sq. mi. = 1.88 bears

Prince CK = 80 square miles X .0033 bear per square mile = 0.26 bears

This could equal a total of about nine bears lost to displacement from the total sustainable NPR-A grizzly population.

Estimating worker/bear encounters lethal to the bear is more difficult. Most lethal encounters could occur in proximity to worker residential enclaves at oil fields and at pump stations on a pipeline. Encounters along the haulroad would probably be more frequent but less threatening because workers could be instructed to leave the area.

It is assumed that worker/bear encounters at Prince Creek Field are so infrequent that only five encounters lethal to the bear would occur in the 35-year project life, including all encounters at pump stations downline of Prince Creek. This low rate of bear destruction would probably be unmeasurable but, it is assumed that one individual could be lost to the NPR-A sustainable population after 35 years.

At Liberator Field, encounters with bears because of higher densities could be seven times more common than at Prince Creek. As many as 35 worker/bear encounters fatal to the bear are anticipated in this model. Proportionately, seven bears may be lost to the NPR-A sustainable population after 35 years.

At Avingak and Utukok Fields, worker/bear encounters lethal to the bear could be 15 times as common as at Prince Creek because of the relatively high density of grizzly bears near the WAH's calving grounds. There could be an estimated 15 encounters fatal to the bear in 34 years and 30 bears may be lost to the NPR-A sustainable population if fields were developed in the Utukok Uplands.

In summary, this hypothetical analysis shows estimated reductions in presently sustainable grizzly populations during the life of oil and gas operations (assumed to be 35 years) as:



Displacement of Grizzly Bears from All Fields	=	9	
Loss to NPR-A Sustainable Population after 35 years			
Prince Creek	=	1	
Liberator	=	7	
Avingak Creek	=	15	
Utukok River	=	15	
		<hr/>	
Total Loss	=	47	Bears

This hypothetical analysis anticipates a reduction in the grizzly bear population equaling 47 bears, equivalent to a 10 to 11 percent decline in NPR-A population over 35 years due to the presence and activity of development. This conservative estimate of decline does not take into account any indirect impacts on sustainable grizzly bear populations due to changes in numbers and/or distribution of caribou, other food sources or other important habitat requirements. Actual loss of sustainable population levels may be much greater due to development.

#### 4. Comprehensive Analysis of Polar Bear

Information on polar bear use of onshore habitats on NPR-A is limited. Available data are summarized in two reports: Benfield (1979) and the 105(c) Land Use Study, "Values and Resource Analysis" Vol. 3, Section 6 (USDI, NPR-A Task Force, 1978). Use of terrestrial habitats in NPR-A is limited to the period from October through April when pregnant females may leave the offshore environment to seek out onland denning sites. Areas chosen for den sites generally are within about 20 miles from the coastline (see Figure 9).

The 105(c) Land Use Study states:

The principal 'change agents' influencing on-land denning habitat are the activities of humans in the coastal zone during winter months. Currently increasing human activity and developments in the coastal zone, including surface travel, construction of temporary and permanent camps, and the removal of snow for human use, will lead to loss of on-land denning habitat or could interfere with freedom of movement to or from these denning areas.

The 105(c) Land Use Study concluded that the best means of preserving polar bear and their habitat was:

...to maintain it in its present status. Any increase in human activities during the winter months (October - April) or increases in permanent developments in the coastal zone, including those activities that would alter the surface topography so as to reduce the availability of suitable snowdrifts for denning purposes, can potentially deter female polar bears from coming on shore to den or interfere with their return with young cubs to the sea ice in the spring. Camps and their associated solid waste can constitute an attraction leading to human/bear conflicts. Removal of snow from drifts for roads, pads, and water supplies can destroy or make unsuitable the same snowdrifts that are most desirable for bear denning sites. At this time no opportunities exist for increasing polar bear habitat. Phasing of coastal development to restrict activities to limited segments of the coastline at any given time is recommended....

In terms of this EIS, Analytical Case 2 (Figure 16) provides an interesting model. It may be possible to design other hypothetical analyses using arbitrary average denning densities and arbitrarily identifying access routes. Unfortunately, the analysis would be of marginal value because the significance of any resulting impacts and the probability of occurrence would be unpredictable given the many unknown variables which could affect the outcome. Therefore, the following residual impact analysis is presented.

It is recognized that some reduction in onland polar bear maternity denning could occur through habitat alteration or loss of access resulting from oil and gas development. However, it is not known if any significant change in polar bear demographics would occur because, although the average density of such onland denning is unknown, any field or complex of fields would likely affect a limited number of potential sites. It is not known if such onland denning is only facultative (desirable) or if it is critical habitat use that limits polar bear populations. If polar bear can shift their pattern of use, then the loss of potential maternal denning sites would not be significant.

Unlike grizzly bears, polar bears do not defend a defined home range. It is possible that if onland denning could occur in any suitable habitat beyond the influence of development, there would be no conflict as the female would simply choose another site. It is also possible that a particular female may have an area preference based on past use. Assuming the latter case, population productivity may be reduced. Without better baseline data to estimate from, the amount of reduction and its significance is unclear.

It is reasonable to assume that oil development would lead to an inevitable attraction of a small number of polar bears to human activity sites. How many of these human/bear encounters would be lethal to the bear because of concern for public safety is unknown but some could occur.

In summary, the residual impacts based on the standard requirements could be: a possible loss in population productivity with all attempts at onland denning in the vicinity of the developments within the denning area ceasing due to range abandonment; and a loss of a few bears destroyed in the interest of public safety.

##### 5. Comprehensive Analysis of Geese

Migratory waterbird ecology on NPR-A has received few intensive studies. Most have been limited to either aerial surveys (King, 1979) or intensive site-specific studies at a few scattered locations within the Reserve (Derksen, Rothe and Eldridge, 1981; Derksen, Eldridge and Weller, 1982; Simpson, Hogan and Derksen, In prep.).

Because there is limited published waterbird data for NPR-A, the Waterbird Discussion Panel (WDP) was convened in May 1982 as a part of the NPR-A Caribou/Waterbird Impact Analysis Workshop (Gilliam and Lent, 1982).

~~The panel recommendations have been used throughout this EIS. Areas recommended by the panel for no surface occupancy leasing to protect significant shorebird and waterfowl habitats are shown as coastal Special~~

Management Zones (SMZ) on Plate One, located in the back of this EIS. Rationale for selection of only white-fronted geese and black brant for intensive impact prediction can be found in the various EIS Scoping Documents culminating in the BLM's Record of Decision (McVee, 1982).

Based on the present knowledge of goose and other waterbird ecology on NPR-A, there are a few locations where oil and gas development fields and/or transportation corridors would cause significant impacts at the NPR-A waterbird population level. There are even fewer locations where impacts could be of significance to continental and world populations. Most of these locales were identified by the WDP with optimism that any previously unknown areas would be discovered and studied during the planning phase of the sale area selection and permitting processes so that appropriate protective measures could be applied. The panel's assessment of impacts assumed that most developments on the Coastal Plain of NPR-A would receive sufficient mitigative planning and field effort to ensure that impacts are insignificant. In large portions of NPR-A, waterbird values are so widespread that a development field encompassing 60 to 80 square miles (155 to 207 sq km) but actually occupying much less than ten percent of that area's surface with production facilities would not measurably affect total population levels. This same unmeasurable effect on waterbird population levels is also applicable to well planned transportation corridors and sufficiently restricted land, sea, and air transportation if the NPR-A coastline and the area to the north and east of Teshekpuk Lake is avoided.

However, the WDP concluded that any fields, roads or pipelines in or through the Teshekpuk Lake Goose Molting Area (TLGMA) would result in the displacement and death of geese. The analysis which follows is adapted directly from Gilliam and Lent, (1982) as an analysis of Case 2 (Figure 16) and replaces the Draft EIS analysis.

With present technology and past experience at Prudhoe Bay and Kuparuk, even "limited entry" (that is, field design to give large no surface occupancy areas) combined with "seasonal restrictions" (that is, complete field shut in during the goose molting period with complete evacuation of all personnel) could reduce or eliminate use by molting geese in the areas north and east of Teshekpuk Lake. The "worst case" prediction of total displacement would result in the loss of molting use to about one-fifth of the world's population of molting black brant (about 30,000) and loss of molting use to about 5,000 white-fronted geese and 15,000 Canada geese with accompanying loss of use of nesting birds. However, there really is no mechanism for accurately predicting the level of population response to any development within this area be it an oil field, permanent road or other facility because so many of the pieces of the equation relating to waterbird use and disturbance are unknown. It is surmised that the greatest danger would be for a development to be so large as to displace all molting geese to unknown areas. If that were to occur, the resultant impact might only be discovered in subsequent years' flyway population counts. Because both the tendency for the geese to use specific lakes within the area and their ability to adapt to other areas is poorly understood or not known, the percent of total population affected at any level of development cannot be adequately predicted.

The panel tried to evaluate developments in isolated portions of the Teshekpuk Lake area with no conclusive result. Even a worst case analysis stating a direct relationship of ten percent occupied habitat resulting in ten percent

loss of molting birds could not be substantiated due to the unknowns regarding goose molting carrying capacities within and without the area of habitat loss, possible unknown synergistic or cumulative impact mechanisms operating within the area and lack of information concerning possible availability and possible use of molting areas totally outside the Teshekpuk Lake area.

Therefore, the panel recommended deletion of the Teshekpuk Lake Goose Molting Area from leasing consideration due to the unknown but potentially devastating effects resulting from development in the area.

#### 6. Comprehensive Analysis of Peregrine Falcon

This analysis was constructed by the EIS team.

° Direct Impacts: Existing NPR-A standard stipulations (see Figure 20), if applied to both active and historical nest sites and enforced, would reduce any direct impacts of petroleum exploration, development and production to levels of unmeasurable significance. The stipulations on Figure 20 stem from a BLM/U.S. Fish and Wildlife Service Formal Section 7 Consultation. That is, to comply with the Endangered Species Act, no permitted facility, activity or operation would be allowed to disturb peregrine falcons or disrupt their nesting success or significantly alter their hunting habitat. At present, the Wild and Scenic Rivers Study withdrawals from leasing (Figure 14) provide additional protection to almost all active peregrine falcon nest sites on the Reserve. However, if no Congressional wild and scenic rivers designations are made on the Reserve, there would be no deletions from leasing except those resulting from the decision of the BLM State Director for Alaska following this EIS process.

° Indirect Impacts: Any development within NPR-A could increase human access to peregrine falcon nest sites. These nests, easy to locate without maps due to the intensive nest defense behavior exhibited by the pair, often can be entered easily from the top of a bluff. Peregrine falcons also may be disturbed by activities below the nest site. If the disturbance is great enough, nest failure is probable.

Although permitted petroleum activities would not cause impacts on peregrine falcons, activities indirectly associated with increased human access to remote areas resulting from petroleum development may affect them. These include increased recreational boating, hunting and fishing on NPR-A, especially within the Colville River drainage due to expanded facilities and work forces at such established NPR-A support bases as Umiat or at such new support bases as Nuiqsut; or increased access to NPR-A by the general public if scheduled commercial airline service began supporting bases such as Umiat or if industrial haulroads were opened to public use. Any increase in recreational use of the Colville River drainage would increase the amount of nest defense behavior by the peregrines and decrease the time available for incubating or hunting. It is also probable that some recreationists would be either uninformed or uncaring enough about the need to protect endangered species to cause some loss of nesting success through intentional or unintentional disturbance at the nest site.

Increased summer subsistence use of the Colville River drainage by subsistence harvesters employed in NPR-A developments could also inadvertently disturb peregrine falcons.

Use of the Colville River drainage as a flight corridor in violation of the 1500 foot (457 m) altitude and one mile (1.6 km) horizontal distance from any peregrine falcon nest site stipulation established in 1977 for the period April 15 through August 31 each year would add further stress. Violations would be most likely to occur during inclement weather when flights in support of petroleum activities would be forced to lower altitudes for air safety concerns. Private or air charter aircraft pilots could violate the regulations at any time due to ignorance of the poorly publicized regulations.

#### Discussion of Comprehensive Analysis

In order to illustrate the types of indirect impacts on peregrine falcons that may be associated with development activities, Analytical Case 1 (Figure 15) which applies to the Colville River drainage, will be used. The EIS wildlife biologist developed this peregrine impact analysis for informational purposes. It is one of many possible combinations of events. However, it does point out that all sources of indirect impacts stemming from petroleum development must be considered and mitigated, as increasing human use of NPR-A can lead to loss of peregrine falcon reproductive success.

For analytical purposes it was assumed that all petroleum exploration, drilling and other permitted development activities would be responsibly executed by the Lessee or his agent with no measurable impact on peregrine falcons or their habitat.

The present productivity of peregrine falcons within the Colville River drainage was set by assumption, as that shown in Table 21.

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T A B L E 21  
Present Productivity of NPR-A Peregrine Falcons  
(Adapted from Dittrick and Swem, 1981)

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	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1971</u>	<u>1973</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Total # of Pairs	27	31	33	25	14	15	16	21	24
# of Pairs With Young	18	16	13	9	4	8	6	12	12
# of Young Observed	34	34	26	14	9	14	15	29	31
Young Per Total Pair	1.26	1.10	0.79	0.56	0.64	0.93	0.94	1.38	1.29

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Assumption: Hypothetically, there are 25 pairs of peregrine falcons on the mainstream of the Colville River in Year Zero. This is assumed to be the year before the industrial haulroad from the Dalton Highway into NPR-A is opened and before commercial air service available to the public begins scheduled service. A hypothetical survey in late July of Year Zero on the Colville River found a total of 25 nesting pairs, 14 pairs with young producing 35 young. The ratio of young to total pairs is, therefore, 1.4 young per nesting pair (35 ÷ 25).

These hypothetical Year Zero results would be encouraging to the biological community as the ratio of 1.4 young/total pairs for the purposes of this analysis is assumed to be the minimum or threshold ratio that if obtained by a total breeding population of 25 pairs would indicate a recovering population.

It is assumed that in Year One both the haulroad connecting NPR-A to the Dalton Highway opens to industrial traffic and commercial airline passenger and freight service begin to the State owned airport at Umiat. Relative cost of access to NPR-A is reduced to the general public and is already provided by the Lessee or his agents for all industrial workers.

Based on these assumptions, the boaters, hunters and fishermen made up of both off-duty industrial workers and the general public, begin to use the roads and short air charters to access the Colville River both up and downstream from Umiat. Heaviest use occurs between June 15 and August 15 when the weather and river conditions are most suitable.

In the opinion of two raptor biologists, increased recreational use of the Colville River drainage would lead to activities that would threaten the nesting success of peregrine falcons and other raptors (Dittrick and Swem, Personal Communication, 1982).

° The nests of cliff-nesting raptors are highly visible along rivers in NPR-A. In addition, the birds' nest defense behavior attracts attention to the nest location. Curious recreationists especially would want closer looks despite disturbance to the raptors. Many of the best spots for fishing on the rivers are at the base of bluffs where the water is deepest. These bluffs are often preferred raptor nest sites. Extended periods of time spent fishing in front of a raptor nest may cause prolonged nest defense.

° Camping directly across from active nests may distract birds from their daily routine and endanger nesting success. Climbing bluffs for better views would disturb the birds.

Human/peregrine falcon confrontations that cause falcon parents to leave the nest and exhibit nest defense behavior for prolonged periods until people leave the immediate vicinity could be fatal to the eggs or chicks, especially during freezing rain conditions common to the Colville River. A hypothetical survey of nesting success in late July of Year One illustrates the effects on chick survival should such extended confrontations occur.

Total number of pairs	=	25
Number of pairs with young	=	12
Number of young observed	=	30
<u>Young</u>		
Total Pairs	=	1.2

This hypothetical Year One population is below the assumed peregrine falcon recovery threshold of 1.4 young/total pair.

It is assumed that in Year Two of this hypothetical scenario, regulatory agencies recognizing a need for better control of peregrine falcon/human confrontations will institute an intensive public awareness program. Every

river user would be informed of new camping, fishing and hunting regulations governing permissible areas along the Colville River. A map is provided clearly identifying all known peregrine falcon nest sites surveyed in Year One. These restrictions would be self-imposed.

In the hypothetical Year Two, no camping in restricted areas was observable by professional guides or by passing pilots cooperating with the regulatory agencies. But in this scenario industry pilots observe occasional instances of recreationists stopping for prolonged periods in restricted areas apparently to observe a peregrine falcon nest during the critical period for the survival of the young. There are rumors of a party's deliberate use of the furnished maps to enter a nest during inclement weather to photograph the young.

The hypothetical survey of nesting success in late July of Year Two based on the above scenario illustrates the possibility of continuing reduction in peregrine falcon recovery:

Total number of pairs	=	25
Number of pairs with young	=	12
Number of young observed	=	30
<u>Young</u>		
Total Pairs	=	1.2

This hypothetical survey indicates the population would still be below the minimum recovery threshold of 1.4 young/total pair assumed earlier to indicate recovery.

Dittrick and Swem (pers. comm., 1982) feel that until some type of enforcement presence is established on the Colville River, loss of sub-adult peregrine falcons to the black market for falconry is also possible, especially if specific maps of the active nests are furnished to the general public.

It was assumed that in Year Three of this hypothetical model, regulatory agencies in cooperation with the Lessee establish an intensive monitoring program of Colville River use. Rangers patrol the river in boats or aircraft regulating river use. Stopping or camping adjacent to occupied bluffs is prohibited, and restricted areas are shown on maps without revealing nest sites. All restricted areas are marked with signs on gravel bars across from occupied bluffs. Potential river users would be informed of restrictions through a mail campaign and the media. All users are contacted through air charter services, at access points, or on the river by patrols.

In late June of hypothetical Year Three, rangers make a helicopter rescue of a photographer injured in a fall from a bluff while attempting to enter a nest. Despite a constant freezing rain, both parents exhibit nest defense behavior until the area is finally cleared. All four chicks in the nest die. Another loss of one chick occurs when it is dislodged from a nest during a banding attempt on the Year Three survey.

The annual hypothetical survey in late July of Year Three finds the population is still below the 1.4 young/total pair assumed recovery threshold. The 25 nesting pairs still have a young to pair ratio of 1.2 (14 pairs with young, 30 young observed).

In summary, this hypothetical analysis is neither intended as an attack on any responsible recreational or industrial use of NPR-A's rivers which should be compatible with continued protection of the peregrine falcon nor on the hypothetical ineffectiveness of BLM to protect endangered species. However, it does indicate that the major cause of impacts on peregrines, increased recreation use of the Colville, is largely outside the control of the Lessee beyond restricting the off-duty pursuits of their employees. Thus, impacts to peregrines are not totally resolvable through stipulations aimed at the Lessee's activities. The BLM response to recreation impacts is discussed under the Preferred Alternative (Chapter Five).

#### 7. Comprehensive Analysis of Other Raptors

The other raptors of NPR-A are divided into two groups: tundra nesters and cliff nesters. The distribution and annual population levels of these birds on NPR-A are highly variable and much more prey dependent than that of the peregrine falcon.

It does not appear that there will be any measurable impacts on the tundra nesting snowy owl or short-eared owl. Relatively few individuals of these broadly distributed species would ever be exposed to the projected type and level of NPR-A oil development given in Shepard et al. (1982). Their rodent prey, because of its broad population base, would never suffer significant loss of carrying capacity except in a few localized areas near actual facilities.

Other cliff-nesting raptors of NPR-A are similar to peregrine falcon with respect to choice of nest site and nest defense behavior. Potential loss of reproductive success as a result of increased human disturbance is possible. Oil and gas development may result in direct impacts at the nest site with loss of eggs or chicks possible. While it may be valid to assume that peregrine falcon stipulations also would secondarily protect the majority of other raptor nest sites, not all of these other raptor nest sites would be protected.

#### Summary of Comprehensive Analysis

- ° Displacement and/or loss of reproductive success of some non-endangered cliff-nesting raptors as a direct and indirect result of development.
- ° Possible interspecies competition for nest sites among displaced raptors and the peregrine falcon.

#### Discussion of the Comprehensive Analysis

It is not known how many other cliff-nesting raptors would receive secondary protection under the peregrine falcon protective stipulations presently in force. However, the following narrative case analysis applicable to any development in cliff-nesting raptor habitat will illustrate possible impacts.

- ° Assumption: Due to the protective stipulations for the peregrine falcon, any permitted activity in cliff-nesting raptor habitat is prejudiced in its choice of options. When an impact is certain, such as from designation of gravel mining areas, rights-of-way, or recreational campsites, the permitted activity must avoid any peregrine falcon impacts regardless of impacts to other raptor species.



On a hypothetical reach of the Colville River drainage, there are only two permitting options available for a proposed activity. Option A would impact one active and one historic peregrine falcon nest site on cliff A. Option B would impact upon the use of adjacent cliff B by two gyrfalcon pairs but no peregrine falcons. With a strict interpretation of the peregrine falcon stipulation, Option B is selected although heavily stipulated.

In a hypothetical raptor survey in years following the permitting decision and subsequent impacts on cliff B, cliff A is found to be occupied by the two former cliff B gyrfalcon pairs which have displaced peregrine falcons from both the active and historical nest sites. While it is probable that the peregrine falcon pair has found a suitable nest site elsewhere, their reproductive success may have suffered both short- and long-term impacts if replacement habitat is less than optimal.

#### 8. Comprehensive Analysis of Fisheries

Petroleum development within NPR-A may alter specific aquatic habitats used for fish migration, spawning, and overwintering or may stress fish using these areas. When fish are concentrated in limited areas for spawning and overwintering, they are vulnerable to catastrophic short-term or chronic low level disturbances that may result in population reductions. However, if the fish species is well distributed, as most species are on NPR-A, it is doubtful that the localized short-term disruptions anticipated from petroleum activities will have a significant effect on the population as a whole. Nevertheless, each proposed petroleum activity must be investigated during the permitting process to ensure that proper site-specific stipulations are attached to a permit because no comprehensive formula to protect every aquatic resource or habitat has been developed.

Potential impacts on fisheries fall into several classes. Local and short-term impacts on fisheries could result from any construction activities which lead to an increase in the sediment load of streams. Downstream from the construction activity these sediments could cover gravels which fish need for spawning and through alteration in the amount of light penetrating the water could alter the productivity of the stream. Short- to long-term impacts could result if an oil spill entered a lake or stream. Short-term local impacts could result during winter from the uncontrolled drawing off of unfrozen water beneath ice for field operations. Long-term impacts could occur if field operations introduce any chemicals into streams.

At the current level of understanding of NPR-A fish and their habitat, fishery management plans and impact projections in the face of petroleum development only can be discussed in general. Important habitat for several fish species is recognized in the Colville River drainage, in the deep lakes in eastern NPR-A and in the major subsistence rivers shown on Plate One.

Site-specific stipulations for each petroleum activity imposed during the permitting process should be sufficient to preclude significant impacts. The design of fishery protection stipulations must recognize that areas identified as important for subsistence uses may require the most stringent habitat protection even though biologically these sites may be relatively unimportant. Conversely, the biological base of a subsistence fishery may depend on the quality of habitats located great distances from the actual fishery site.

Therefore, even though no significant individual or cumulative impacts are envisioned due to the application of site-specific stipulations, all activities must be carefully evaluated to protect the resource and maintain the integrity of the natural ecosystem.

#### B. The Deletion Alternative

The purpose of the deletion alternative is to mitigate or lessen the total impacts of a leasing program in NPR-A that may lead to petroleum developments. At best, the deletion alternative will help the high risk biological resources so protected to maintain their present status with respect to adjacent development.

° Caribou: The Caribou Discussion Panel (Gilliam and Lent, 1982) recommended the deletion of the Western Arctic Herd's central calving area (see Plate One) from the leasing program because:

Development of oil fields in this area, particularly when considered together with the probable east-west corridor to the TAPS and the possibility of additional fields in southern and eastern NPR-A, represents a level and scope of potential impacts on a migratory caribou population for which there is no historical precedent.

This recommendation with slight modification was adopted in the Preferred Alternative (Plate One).

° Grizzly Bear: Reynolds' (1979) suggestion for the formation of "Enclaves of Intact Habitat" was considered as a deletion alternative for the high density grizzly bear habitat in southwestern NPR-A. However, based on the comprehensive analysis for grizzly bear and the likely level of NPR-A oil and gas development, deletion of any area for grizzly bear mitigation was not considered as the optimal solution. Plate One shows that a Special Management Zone has been established in southwestern NPR-A.

° Polar Bear: Little is known of polar bear use of the Reserve or of NPR-A's significance to regional polar bear demographics. Therefore, it was not possible to develop any meaningful deletion alternative as mitigation for polar bear.

° Geese: Due to the high environmental values to molting geese and other waterbirds, the Waterbird Discussion Panel (Gilliam and Lent, 1982) recommended deletion of the area to the north and east of Teshekpuk Lake. Based on the analysis of this EIS and the high oil and gas potential of this area (Figure 2), the Preferred Alternative deletes only those areas most important to black brant molting use (Figure 6) and provides other mitigations through the establishment of a Special Management Zone for the remainder of the recommended deletion (Plate One).

° Peregrine Falcon: This EIS analysis predicts that there will be no direct impacts on peregrine falcons from oil and gas leasing or development. Deletion as mitigation is not required, but a Special Management Zone has been recommended along the Colville River (Plate One).

° Other Raptors: As with peregrine falcons, most impacts to other cliff-nesting raptors will be from the indirect impacts of NPR-A development, such as increased public access. Other raptors will also receive some level of secondary protection from peregrine falcon stipulations. Deletion as additional mitigation appears to be unwarranted.

° Fisheries: Fisheries surveys to date have not indicated any portion of NPR-A of such high biological value to the maintenance of fishery populations as to warrant the mitigation of deletion. The value of NPR-A fisheries is to the subsistence lifestyle. The combination of present subsistence protections (Figure 20) and Federal and State requirements for pollution control provide adequate mitigations.

### C. The Deferral of Leasing Alternative

The Draft EIS attributed several advantages to deferral of leasing until 1992 in certain areas of NPR-A that in further analysis for this Final EIS appear to be nonexistent. Even if extensive studies could be undertaken on NPR-A, it does not appear that in 10 years the BLM would be in any better position to consider the leasing of certain areas than at present. The BLM has no firm study proposals or funding capable of answering basic questions on fish and wildlife compatibility with oil development on a regional basis. The BLM intends to conduct site-specific studies with Lessees and possibly in cooperation with the State and North Slope Borough to solve specific permitting questions of local or regional significance for the NEPA compliance document required of any activity on the Reserve. The following deferral recommendations were considered, however, in the formulation of the Preferred Alternative.

° Caribou: The CDP (Gilliam and Lent, 1982) recommended deferral of leasing in the range of the Teshekpuk Lake Herd (TLH) until at least 1987. This delay would allow current BLM and Alaska Department of Fish and Game studies on the TLH to be completed and analyzed with respect to the knowledge gained from studies on long-term effects on the CAH. Deferring leasing in the range of the TLH would also ensure that any discovery would not come "on-line" until after the decline of Kuparuk and Prudhoe to the east, thereby limiting the number of calving grounds receiving simultaneous impacts. This recommendation was not accepted, but a Special Management Zone has been proposed (Plate One).

The panel also recommended that an area adjacent to the present WAH central calving area be deferred from leasing. It was thought that as the WAH population grows, this area would become heavily used for calving. Therefore, these tracts were recommended for deferral until long-term trends become more obvious. This recommendation was not accepted in the Preferred Alternative as it represents only a potential expansion of the central calving area but a Special Management Zone has been proposed (Plate One).

An area west of the core Utukok WAH calving area also was considered for deferral at the request of the North Slope Borough. The village of Point Lay had requested deferral here to mitigate possible loss of subsistence caribou hunting. This area has been protected as a Special Management Zone (Plate One).

- ° Grizzly Bear: Deferral of leasing as a mitigation of predicted grizzly bear impacts does not appear to offer any clear advantage in a Final EIS analysis but an area in southwestern NPR-A was recommended for deferral in the Draft EIS. Although it is possible that future changes in oil field technology may eliminate many potential grizzly bear impacts, encounters between humans and bears that could be lethal to the bear may still occur and this area has been included in a Special Management Zone (Plate One).
- ° Polar Bear: It is not believed that deferral of leasing in onshore polar bear habitats would be of any long-term advantage. To date, there is no evidence to confirm that properly controlled developments in nearshore habitats would have any significant effect on polar bear demographics.
- ° Geese: The Waterbird Discussion Panel (Gilliam and Lent, 1982) recommended deferment of leasing in the Fish Creek delta near Nuiqsut (Plate One). This recommendation was accepted to allow an opportunity for U.S. Fish and Wildlife Service ecological studies on the Fish Creek-Colville River deltas to be completed by 1987. As Draft EIS commentators noted, the study area was misidentified but corrections have been made on Final EIS Plate One. Completion of ecological studies on the Fish Creek salt marshes, which are seasonally used by geese, will increase the ability of land managers to predict impacts and design effective mitigation during the lease tract selection and permitting processes.
- ° Peregrine Falcon: Under the provisions of the Endangered Species Act, BLM cannot authorize any activity that would impact on an endangered species. Whether a nest site is on or off a lease is immaterial to this law. Even if all peregrine falcon habitats were deferred from leasing, indirect impacts from increased recreational use of NPR-A rivers may still threaten peregrine falcons. Therefore, deferred leasing would not significantly benefit the peregrine falcon.
- ° Other Raptors: There are no clear advantages to deferred leasing in preferred cliff-nesting raptor habitat. As with the peregrine falcon, deferment of leasing would not necessarily result in reduction of indirect impacts from increased recreational use of the NPR-A river systems.
- ° Fisheries: The BLM feels that present stipulations for the conservation of subsistence fisheries plus the application of the Design Solution Concept will adequately protect NPR-A fisheries without the need for deferrals.

#### D. The Design Solution Alternative

The presently required "standard" leasing and permitting stipulations presented in Figure 20 are mainly directed towards controlling the impacts of further exploration activities on NPR-A. They are based on previous experience with the Federal government's NPR-A exploration program. Exploration oil activities governed by these stipulations have resulted in few, if any, significant impacts on NPR-A's resources. Impacts from further exploration within NPR-A would be insignificant should these types of stipulations continue to govern all future exploration, including winter exploratory operations in NPR-A's most sensitive environments in the Utukok Uplands, the area around Teshekpuk Lake, and certain coastal areas. These are the conclusions of the participants in the NPR-A Caribou/Waterbird Impact Analysis Workshop (Gilliam and Lent, 1982).

However, granting a lease implies that the Lessee has the right to develop any discovery. While the Federal government may specify the methods of development to be used so that impacts are minimized, the Lessee has the right to develop and produce the discovery.

The Federal government's responsibility to protect NPR-A resources before the location and type of petroleum development activity are precisely known requires management that is flexible enough to cover differing levels, types and locations of oil development activities. Design Solutions to minimize environmental impacts would be implemented in the leasing/permitting processes for future lease sales or activity-specific permits.

The Draft EIS failed to emphasize that every proposed activity on NPR-A leases must be analyzed in a National Environmental Policy Act (NEPA) compliance document. The NEPA documentary may be a Finding of No Significant Impact (FONSI), an Environmental Assessment (EA) or an Environmental Statement (EIS). The Design Solution Concept, which is applicable to all NPR-A permitting decisions, and its special case, the Special Management Zone, (see Plate One) are explained in Chapter One. The Design Solution has been proposed for use in the BLM "Information to Lessee" and in Special Lease Stipulations published in the "Notice of Sale" preceding each offering of NPR-A tracts. More importantly, the Design Solution Concept is proposed to end the perceived adversarial role between BLM and the Lessees and begin a cooperative effort aimed at reasonable protection of the NPR-A resources while fulfilling the intent of the Appropriations Act to develop the petroleum potential of NPR-A.

The following discussions highlight the solutions that NPR-A petroleum development may require. These suggested solutions are the starting point for the cooperative BLM/Lessee planning and NEPA compliance process preceding any proposed activity on NPR-A leases.

° Caribou: The CDP made several specific recommendations regarding "freedom of passage" for caribou and the level of activity allowable in a field or corridor during sensitive periods for caribou (Gilliam and Lent, 1982). The CDP recognized that without a specific proposed project their recommendations were necessarily broad and qualitative. All roads, pipelines, maintenance procedures, activity schedules and permissible corridor activity levels must minimize caribou disturbance and avoidance. They must provide an opportunity, if behavioral changes are possible, for caribou to gradually habituate to petroleum related operations on NPR-A. The Design Solution Concept is a means of gathering adequate baseline information to identify effective freedom of passage design permitting solutions and generally reduce caribou disturbance to an acceptable level.

° Grizzly Bear: Design Solutions for grizzly bear must reduce the number of worker/bear confrontations anticipated by developments in southern NPR-A, thereby reducing predicted population loss. Grizzly bear habituation to humans must be avoided. Grizzly bears that lose their fear of man and his environs are dangerous to public safety and must be removed or shot. Whereas example solutions for caribou encourage habituation, the example solutions for grizzly bear would discourage habituation.

## 1. Guidelines for Planning and Permitting

The following guidelines may be incorporated into the activity and facility siting planning and permitting processes for all areas in southern NPR-A:

- ° Proliferation of satellite facilities away from the main field camp, except for drill pads necessary to drain a producing field, should be minimized.
- ° Consideration should be given to fencing all permanently inhabited facilities to restrict the workers and their waste to a manageable area and to prevent unchallenged grizzly entry into a development.
- ° Public safety concerns should be modified to stress measures that maintain a safe distance between workers and bears rather than those that stress destroying troublesome bears. Bears should be tolerated within non-threatening locations in the field and prevented by fencing or other measures from gaining access to portions of the field where they may damage equipment or facilities. The field must be closed to sport hunting.
- ° Use of field roads or airstrips by travelers not a part of field staff or not under staff supervision must be restricted to prevent interaction with bears using remote parts of the oil field. All land and air travel emanating from the field should avoid disturbing adjacent grizzly bear use subject to safety considerations.
- ° All permanent facilities should be located so as to maintain the highest compatible traditional bear use.

## 2. Site-Specific Data Requirements for Example Solutions

The preceding example solutions may prove useless unless adequate site-specific baseline information concerning bear use is obtained as a part of the planning process.

° Polar Bear: Example solutions for polar bear are similar to those identified for grizzly bear. The prime requirements involve: mapping of suitable maternity denning areas prior to site selection; minimizing alteration of maternity denning sites near fields; assuring polar bear access around the periphery of a field by consolidating support facilities; carefully scheduling any activity that may disturb polar bears; and instituting a public safety and environmental awareness program that stresses avoidance of polar bears so that the number of human/bear encounters lethal to either the human or bear are minimized.

° Geese: Continued use of existing BLM waterbird protection lease stipulations (see Figure 20) will give BLM managers sufficient authority to restrict most oil and gas activities where required to minimize impacts during the period of May 20 to August 25 each year. The Waterbird Discussion Panel (Gilliam and Lent, 1982) recommends that low altitude aircraft overflights, surface travel and geophysical surveys be prohibited during summer in areas of high waterbird values on the coastline of NPR-A or in areas deleted from the leasing program. Permitting low altitude aircraft overflights, surface travel, and summer geophysical surveys on other areas of the Coastal Plain would be done on the basis of existing site-specific environmental factors.

However, without a site-specific data base prior to permit application, application of specific restrictions over broad areas of operation may be either too restrictive if no resource is actually present, or not restrictive enough if the specific mitigative measures required are incorrect. Therefore, the type of solution required is one which stresses application of effective mitigations to the actual, not hypothetical, resource involved.

° Peregrine Falcon: Despite public or agency opinion to the contrary, regulatory agencies and the Lessee or permit applicant share the responsibility for protection of an endangered species from measurable impact during all phases of a proposed project, activity or operation adjacent to the species habitat. No permitted activity will be allowed to impact peregrine falcons. Lease stipulations have already been designed to prevent any measurable direct impacts. The petroleum industry agrees by acceptance of their lease to abide by these stipulations as a condition of the lease.

Indirect impacts on peregrine falcons cannot be ignored. The Colville River drainage hosts a world class density of the remaining Arctic peregrine falcons. The petroleum industry must do everything possible to control indirect impacts including controlling the off-duty recreational activities of all personnel within a development field. The mandated environmental awareness training for industrial workers must educate them about the possible environmental consequences of all their activities in the vicinity. The Lessee is responsible for the conduct of their own employees as well as those of their agents, contractors and sub-contractors. The Lessee may be held responsible for the activities of service company personnel who benefit the Lessee or to whom the Lessee provides facilities or access such as salesmen, technical representatives, geophysical companies and visitors. However, the Lessee cannot be held responsible for the conduct of recreationists gaining access to the Colville River drainage through public facilities.

° Other Raptors: Use of the Special Management Zone (SMZ) designation as specifically tailored to the protection of other raptors as well as the peregrine falcon is the best Design Solution (Plate One). The SMZ stipulation appears to offer optimal protections regardless of the final outcome of current Wild and Scenic River Studies or BLM policy options to close the Colville River drainage to recreational use in early summer.

° Fisheries: The Design Solution Concept combined with the presently established lease stipulations protecting the subsistence lifestyle offer the best protections for subsistence fishery resources. The North Slope Borough and the people of the villages on or adjacent to NPR-A in public meetings and in written comments have expressed their desire to be involved in the sale area selection and subsequent permitting process. They are extremely concerned about potential impacts on subsistence fishery resources and other issues that could affect their traditional lifestyle. The BLM accepts this offer of assistance from the people of the North Slope Borough. The Design Solution Concept incorporates a cooperative forum among the BLM, the Lessee, agencies and entities with sufficient knowledge to make better management decisions for the NPR-A.

#### E. Seasonal Restrictions Alternative

° Caribou: The CDP (Gilliam and Lent, 1982) generally agreed that the impacts of exploratory activities can be controlled and mitigated if stipulations appropriate to the season and location are applied. Winter-only geophysical and test wells were recommended on any areas near the Utukok calving grounds or within the range of the Teshekpuk Lake Herd. However, the panel did not believe seasonal operating restrictions would alleviate the expected impacts from developments in the calving areas of the WAH or TLH.

The panel, acting on the workshop premise that BLM would close all development roads on NPR-A to the public, recommended conveying or otherwise limiting traffic on any east-west haulroad as essential to increasing the chances of caribou crossing success from May 15th to July 15th. Such curtailment of activity in the corridor could reduce impacts envisioned in the comprehensive analysis.

Seasonal restrictions may also be required to control the disturbances of low altitude aircraft operation, road and pipeline maintenance or other activities associated with a development. Many of these restrictions will be evident only after the specific caribou use patterns for a particular development site are considered in the NEPA compliance document required in all NPR-A permitting processes.

° Grizzly Bear: Site-specific seasonal restrictions may be very effective in controlling impacts of development on local grizzly bear populations especially if used in conjunction with site-specific no surface occupancy clauses to protect high density denning, feeding and travel areas. However, as with all other restrictions, application of seasonal restrictions must be based on adequate baseline data to be able to determine what areas and what periods would require seasonal restrictions.

° Polar Bear: Any seasonal restrictions proposed for polar bear protection must be based on a better understanding of onshore polar bear use than is presently available. Placing a seasonal restriction on activities within 20 miles (32 km) of the coastline for the period from October to April in conjunction with a similar summer restriction to protect waterbirds could eliminate any possible development by a potential lessee. If any seasonal restrictions are to be made, they should be at the permitting level where site-specific conditions have been assessed and the relative risk of polar bear disturbance is better understood.

° Geese: Current NPR-A Lease Stipulations (Figure 20) provide adequate authority to protect seasonally sensitive use of the Coastal Plain by geese. The Waterbird Discussion Panel (Gilliam and Lent, 1982) specifically recommended that geophysical, test well drilling and aircraft overflights below 1,000 feet (304 m) be suspended from May 20 through August 25 each year in all areas recommended for special management or deletion from the leasing program (Plate One).

° Peregrine Falcon: Seasonal restrictions on the Lessee have already been adequately provided for as in Figure 20.



- ° Other Raptors: Seasonal restrictions for peregrine falcon protection are generally applicable at the permitting level to other cliff-nesting raptors.
- ° Fisheries: Seasonal restrictions may be generally applicable at the permitting level to conserve fish migration and spawning periods from construction impacts at stream crossings.

## II. EFFECTS ON RECREATION AND PRIMITIVENESS

The Alaska Outdoor Recreation Plan (State of Alaska, 1981) indicates that there is considerable public demand for the recreational opportunities that the NPR-A could provide if public access to petroleum development roads was allowed. An Alaska Outdoor Recreation survey found that recreationists want more opportunity to pursue outdoor experiences and that costly access and lack of public roads was the major constraint. Based on information from the plan, it is conceivable that sport hunters, canoeists, rafters and fishermen have identified improved access via new public roads as an awaited opportunity to expand their pursuits into NPR-A.

However, the comprehensive analyses prepared for this EIS and comments from the people of the North Slope indicate that providing the general public largely unrestricted access to NPR-A on potential development roads and airstrips may make the total impact of petroleum development unacceptable. While it is possible to adequately mitigate the direct effects of petroleum activities within NPR-A, it may not be possible to adequately mitigate the effects of improved and unrestricted public access. Increased public access could lead to increased fish and wildlife sport harvest and disturbance to peregrine falcons, or human/wildlife confrontations that disturb wildlife or lead to their destruction in the interest of public safety. Consequently, total impacts would have to be revised.

This EIS must respond to the effects of oil and gas leasing within NPR-A and identify, where possible, effective mitigation. Many of this EIS's impact predictions are based on the premise that effective mitigation for possible increases in public access is to prevent any increased unrestricted public access to NPR-A beyond the present level. However, this mitigation may not be easy to implement. Lessees understandably will want to have the roads and airstrips built by industry in support of petroleum development eventually transferred to the public sector to alleviate the heavy tax burden and maintenance costs incurred. If these industry built roads and airstrips are to become public property, the general public can reasonably argue for access. Therefore, the BLM's most effective mitigation as the Federal land manager of NPR-A is to require a planning and NEPA compliance procedure before public transfer of industry built roads or airstrips is undertaken or before approval is given for unrestricted access to NPR-A on such roads or airstrips.

The primitive landscape of NPR-A and the wild character and values associated with the terrain along the Colville, Utukok and Etivuk-Nigu Rivers within NPR-A have been repeatedly stressed by many Draft EIS commentors. The BLM recognizes these qualities as a responsible multiple use land managing agency. However, the BLM also recognizes the Congressional intent of P.L. 96-514 which indicates that no "wilderness" designations will be made in the Reserve and the intent of P.L. 96-487 which reserves the right of Congress to determine if any rivers within NPR-A are to become wild and scenic rivers. The BLM cannot

reinterpret Congressional authority through administrative procedures. The BLM intends to conserve all other resources under a multiple use policy while petroleum development is allowed to proceed. BLM will utilize the "Protection of Visual Quality" requirements shown in Figure 20 along with other appropriate visual resource management directives throughout the Reserve to conserve the primitive character of NPR-A. Until Congressional intent for the four wild and scenic study rivers on the Reserve is known, the BLM will continue to withdraw from leasing all lands within two miles (3.2 km) of either side of each study river. If Congress includes any river in the wild and scenic river system, BLM will recognize the permanent withdrawal from leasing of all lands within one mile (1.6 km) of such designated river reaches and will responsibly manage these areas under appropriate regulations. If there is no indication of Congressional intent to designate any river by September 1984, the BLM will manage these rivers within NPR-A for multiple use.

### III. EFFECTS ON SOCIOCULTURAL AND SUBSISTENCE ISSUES

Recent literature on rapid industrial growth in rural areas paints a picture of increasing crime, alienation, drug and alcohol abuse, bureaucratization of decisionmaking and a general loss of well-being wherever the slow-paced and predictable rural social environment undergoes rapid growth from energy development. One analysis of the problems and issues associated with energy "boom towns" states:

Unfortunately, our ability to extract and process mineral riches is not matched by our ability to deal with the social consequences and human costs of rapid growth and development (Davenport and Davenport, 1980).

This EIS discusses some changes in the social environment that may result from NPR-A oil development. However, the EIS authors are aware that many social problems existed on the North Slope prior to energy development. A recent study (U.S. Department of Agriculture, 1979) rated 3,097 U.S. counties in terms of social well-being. The North Slope Borough had the highest level of alienation of all U.S. counties, according to that report. The alienation score used in this social well-being study was based on two indicators: suicide rates and deaths from cirrhosis of the liver (Ross, Bluestone and Hines, 1979). This extremely high level of alienation largely predated oil and gas development on the North Slope. Thus current and future energy development may aggravate rather than be the basic cause of those social problems that residents of the North Slope will confront.

Recently, Inupiat communities have been stabilized by the income transfer and job creation programs of the North Slope Borough based on the tax base derived from present North Slope petroleum development (University of Alaska, 1981). Borough spending is a major source of jobs and income for young Inupiat within the village setting (Alaska Consultants, 1981). They no longer have to leave to find jobs but can choose to remain in the village, supporting their households both with wages and continuing a subsistence lifestyle.

These changes in Inupiat society will continue as the Borough pursues a "full employment for Inupiat" social policy, and they will continue without oil and gas development on the NPR-A as long as petroleum developments as a tax base is available within the Borough. The rate and direction of these social changes cannot be predicted.

Oil development in the NPR-A would magnify the intensity of currently existing sociocultural changes. Some of these changes will be viewed as beneficial; other changes will be defined as adverse. By a magnification in intensity, BLM means that the frequency and breadth of sociocultural changes would increase. Those Inupiat currently experiencing sociocultural gains or losses would experience them more frequently if oil development comes to the NPR-A. Inupiat not now experiencing those impacts would begin to experience impacts as NPR-A oil development proceeds. The general impacts are listed on Table 22.

Impacts to the rural subsistence lifestyle of North Slope peoples would vary from alternative to alternative. Under any leasing program, oil fields in the Teshekpuk Lake area could lead to changes in use of that area by the Teshekpuk Lake Herd (TLH) for calving. Fewer caribou may use the lands previously occupied year round by 4,000 to 6,000 caribou. TLH caribou could merge with the Western Arctic Herd and at least seasonally would be outside the range of subsistence harvesters from Nuiqsut. Nuiqsut people likely would define the loss of access to these resident caribou as a significant impact on their subsistence lifestyle. Fields developed in the Utukok core calving grounds of the Western Arctic Herd (WAH) could split the WAH into two components with only a portion of the herd remaining migratory. Since some of the herd may no longer migrate south of the Brooks Range, the number of caribou available to hunters within the NANA region (Kotzebue, Kivalina and the villages of Noatak, Kobuk and Selawik River drainages) could be reduced.

The deletion from leasing of the Utukok core calving area would substantially reduce the risk of a split in the WAH. Thus the number of caribou migrating south of the Brooks Range may not be measurably changed by oil development under the deletion alternative. However, adoption of the deletion alternative alone may not resolve the issue of possible reduction of caribou available to the people of Anaktuvuk Pass, Nuiqsut or the people of villages of the Upper Kobuk, Upper Noatak, Alatna and Koyukuk River drainages.

Pipelines originating outside the deleted lands in the Teshekpuk Lake area could still act as a barrier to the traditional counterclockwise movement of the Teshekpuk Lake Herd (TLH) of caribou and the TLH may still abandon habitat near Nuiqsut. Pipelines in southern NPR-A outside the deleted WAH core calving area could still cause a westward shift in the WAH fall migration and may lead to changes in the distribution of the Central Arctic Herd of caribou.

Caribou could be outside the range of subsistence harvesters from Anaktuvuk Pass and hunters from the Upper Kobuk/Noatak and Alatna to Koyukuk River villages.

The barrier effect of roads and pipelines may be required or eliminated through selection of designs or routes, convoying of trucks or using inventory control methods to reduce human activities. Special designs may reduce the barrier effect of NPR-A roads and pipelines to caribou. However, these proposed solutions have not been tested on the NPR-A to determine their true effectiveness.

T A B L E 22  
Potential Beneficial and Adverse Social Effects

<u>Potential Events</u>	<u>Primary Impact</u>	<u>Secondary Impact</u>
Increase in number of residents in response to NPR-A employment opportunities	Shift cultural composition of region to non-Native.	Worsen race relations
	Shift sex ratio of population to predominately male.	Make maintenance of traditional culture difficult.
	Loss of regional isolation.	Stress social structure.
	Increase demands on transportation facilities and community services.	Intensify area crime problems.
	Increase demands for housing.	Increase alcohol/drug abuse and other health problems.
	Stimulate nontraditional use of wildlife.	Complete with subsistence use of wildlife and make subsistence hunting more difficult.
	Change traditional land use patterns.	
	Make new or increased demands on village and Borough government.	
Habitat alteration (direct disturbance) or adverse influence on wildlife (noise from machinery or aircraft crates avoidance zones).	Increase cost of living.	
	Decrease numbers of subsistence animals.	Decrease opportunities to pursue traditional activities.
	Increase access to traditional subsistence lands.	Stress traditional kinship patterns.
	Increase access to traditional subsistence lands.	
	Increase difficulty of locating subsistence animals.	

See next page.



Even if all the proper solutions were implemented and the designs were found to be effective in reducing the barrier effect of roads and pipelines, caribou distribution could still be altered by the tendency of caribou to avoid human activity. It is not possible to specifically predict whether this shift in caribou distribution would measurably reduce the number of caribou available to subsistence harvesters. Significant subsistence impacts to harvesters in the Upper Kobuk, Upper Noatak, Alatna and Koyukuk River villages could occur if a major shift in caribou distribution results from developments in southern NPR-A. Similarly significant subsistence impacts could be experienced by Anaktuvuk Pass hunters if there is a major shift in the distribution of caribou. However, the EIS preparers could not quantify the effect of NPR-A developments on caribou migration: how many caribou would migrate south through historic passes versus how many would shift fall migration. Nor is it possible to predict the degree to which caribou distribution would be altered leading to significant subsistence impacts to the hunters of the Upper Kobuk/Noatak to Alatna and Koyukuk area.

Table 23 is presented as an attempt to summarize potential effects of NPR-A oil and gas leasing and any subsequent development on the people from villages on or adjacent to NPR-A.

T A B L E 23  
Summary of Potential Beneficial and Adverse  
Impacts to Villages Resulting From Oil and Gas  
Leasing and Development in the NPR-A

Affected Village(s)	Impact Summary
Barrow, Nuiqsut, Atqasuk and Wainwright	<u>Social Effects:</u> Potential beneficial and adverse social impacts to villages are summarized on Table 22. The severity of such potential impacts, such as increased stress and alcoholism, depends on the specific location and intensity of eventful petroleum development.
"	<u>Subsistence Effects:</u> Possible decrease in subsistence animals might occur; animal behavior and diversity may change in response to development; increased airflights; new roads and their use; and oil spills could adversely affect animal numbers and distributions; residual impacts to game will remain at some level.
Barrow, Atqasuk, Wainwright and Anaktuvuk Pass	<u>Caribou:</u> Potential change in fewer caribou availability if development comes in <u>Utukok River Area</u> which might include an east-west pipeline to TAPS.
Nuiqsut	<u>Caribou:</u> Potentially fewer caribou available if development comes around <u>Teshekpuk Lake</u> , particularly compounded if a road connection is made to Kuparuk - Prudhoe Road.
Wainwright, Point Hope and Kivalina	<u>Caribou:</u> Potentially fewer caribou available if development comes in the <u>Western Part of the NPR-A</u> , particularly compounded if a pipeline were built to Cape Thompson vicinity.
Anaktuvuk Pass and Villages South of NPR-A	<u>Caribou:</u> Possible reduction in caribou coming through Anaktuvuk Pass and southward if development comes in the <u>Upper Colville River Area</u> (between Umiat and Jubilee Creek in Colville River headwaters).
Villages in Upper Kobuk, Upper Noatak, Alatna and Koyukuk River Drainages (South and South- west of NPR-A) including: Kotzebue, Kivalina, Selawik, Alatna and Others	<u>Caribou:</u> Possible reduction in caribou available if petroleum development in <u>any part</u> of the NPR-A impacts caribou calving areas, food sources, predation rates, or migration routes.
Barrow, Atqasuk, Nuiqsut, Wainwright and Point Lay	<u>Fish:</u> Oilspills could damage subsistence fisheries.  <u>Waterbirds:</u> Potentially some displacement of waterbirds around Teshekpuk Lake but not thought to be significant.

## CHAPTER FIVE. COMPARISON OF ALTERNATIVE/RESIDUAL IMPACTS

### I. CHOOSING AN NPR-A LEASING PROGRAM

Judging from the comments received on the Draft EIS, the presentation of alternative leasing programs through a series of illustration plates highlighting the conservation measures considered did not clearly communicate the intended information. Therefore, this Final EIS will use narrative models to discuss alternative leasing programs.

In designing any NPR-A leasing program, three questions must be answered with regard to P.L. 96-514 directives:

- ° When to lease?
- ° Where to lease?
- ° How to lease (under what conditions)?

"When to lease" is answered by P.L. 96-514's mandate to lease expeditiously. Petroleum exploration, development and production would proceed at almost the same pace under any leasing program. There is not much difference in anticipated environmental effects between a one-year, five-year or ten-year leasing program because each requires a reoffering program to respond to discoveries and/or heightened industry interest that result from continuing geophysical surveys.

"Where" and "how to lease" are more broadly defined under P.L. 96-514 by the statement:

...activities undertaken pursuant to this Act shall include or provide for such conditions, restrictions and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonable foreseeable and significantly adverse effects on the surface resources...

This passage clearly indicates that NPR-A petroleum development does not preclude maintenance and conservation of other NPR-A resources under multiple use management although certain provisions for "wilderness" designation and "planning" are especially excluded. The leasing alternatives discussed in Chapter One, Section V are "where" and "how to" lease alternatives.

The decision criterion guiding BLM management for the NPR-A is to maximize the amount of land offered for lease while mitigating reasonably foreseeable and significantly adverse effects on its human and natural environments. The BLM views each of the alternative leasing strategies expressed in Chapter One as the real alternatives for any leasing program and as a response to the Council on Environmental Quality (CEQ) definition of mitigation in 40 CFR 1508.20:

- ° Avoiding the impact altogether by not taking a certain action or parts of an action (Deletion/Deferral);



- ° Minimizing impacts by limiting the degree or magnitude of the action and its implementation (Standard Requirements/Seasonal Restrictions/Design Solution);
- ° Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (Standard Requirements/Design Solution);
- ° Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action (Standard Requirements/Design Solution); and
- ° Compensating for the impact by replacing or providing substitute resources or environments (Standard Requirements/Design Solution).

Many alternative leasing programs could be designed using a variety of responses to the when, where and how questions. BLM has selected three separate composite leasing programs corresponding to liberal, conservative and moderate interpretations of P.L. 96-514. These three alternative leasing programs lie between the two types of leasing programs implicitly excluded by P.L. 96-514:

- ° Pursuit of oil and gas potential without regard to possible environmental effects (the "economic efficiency" alternative); and
- ° Protection of the environment to the exclusion of oil and gas development (the "no action" alternative).

These three leasing programs present different perspectives on the two competing objectives of P.L. 96-514: promotion of an expeditious program of oil and gas leasing and development to be balanced against application of effective mitigation of reasonably foreseeable and significantly adverse effects. All alternative programs would require further NEPA compliance in the permitting process.

#### A. Alternative A: Maximizing Discovery and Development Opportunities

Alternative A places the major emphasis on facilitating the discovery and production of petroleum.

##### 1. When to Lease

There would be one scheduled sale in late 1984 offering all lands within NPR-A and exposing all of NPR-A to a free market process. This gives industry a year to conduct geophysical surveys to supplement the Federal exploration program. It also allows Congress to make final decisions on wild and scenic rivers and U.S. Fish and Wildlife Service (FWS) to determine what portions of the Alaska Maritime National Wildlife Refuge (AMNWR) should be leased. Tracts would be leased based on company interest and BLM bid acceptance. Reoffering sales would be held as necessary to meet management objectives and to encourage petroleum discovery and development.

##### 2. Where to Lease

There would be no administrative deletions or deferrals.

### 3. How to Lease

The use of special lease stipulations would be minimized by using only the peregrine falcon, habitat preservation and cultural resources stipulations shown on Figure 20. The major emphasis of BLM management would be applied in the usual operational guidance of the permitting process. In this alternative the BLM and representatives of the petroleum industry would jointly review any proposed stipulations to delete any requirements that were too restrictive. The industry would be encouraged to use "state-of-the-art" mitigative measures utilized in other Arctic developments and would be responsible for impacts incurred.

° Advantages: Alternative A, the most expeditious leasing alternative, provides one EIS for each sale. It also parallels industry's view that petroleum development can be conducted in the Arctic without significant impacts. Impact mitigation would be provided in the permitting process and by following the practices developed by the industry at Prudhoe Bay and Kuparuk oil fields.

° Disadvantages: Alternative A may offer more acreage than industry is prepared to lease. The petroleum industry has only a finite amount of capital available at any given time and their ability to quickly and adequately evaluate and purchase leases may be hampered by such a large offering. The potential for rapid discovery may be reduced by bidding competition for the best areas. However, the reoffering program should eventually enable all of the highest potential areas to be leased. Under Alternative A, the only areas of NPR-A that would not be potentially affected by petroleum exploration, development or operations would be those areas not leased or not crossed by transportation corridors. Since the petroleum industry would take a major role in determining effective mitigation in any permitting process, a company may be required to make sure that site-specific mitigations remain effective throughout a project's life and that possible cumulative effects are minimized when and if they are combined with other permitted NPR-A uses. This alternative's biggest drawback could be the BLM's inability to convey the level of environmental risk through special lease stipulations issued prior to sale. This also could severely limit a company's ability to adjust bids in a sale and avoid "surprises" in a permitting process.

° Relative Environmental Risk: Alternative A has the greatest relative risk of both singular and cumulatively significant impacts on high risk resources and issues. Alternative A by allowing leasing to occur anywhere in the NPR-A would potentially expose the greatest amount of land to industrial activity. Specific impacts would be similar to those discussed in Chapter Four, Section I.A. Most provisions for mitigation would be made at the permitting level and would concentrate on minimizing site-specific impacts as a solution to potential cumulative or regional impacts. Prospective mitigations would concentrate heavily on the knowledge gained from experiences at the Prudhoe Bay and Kuparuk oil fields and along the TAPS/Dalton Highway corridor despite any ecological differences between these areas and NPR-A. Effective mitigations using only site-specific solutions probably could be designed to conserve and reduce significant impacts to total NPR-A populations of most fish and wildlife resources. However, designing appropriate mitigations for caribou, black brant molting areas, sociocultural and subsistence issues, and recreation and primitiveness requires both a regional

and site-specific mitigation perspective. Alternative A removes or reduces the three methods of treating issues of regional significance in the leasing process: deletion, special management zones, and special lease stipulations. For example, the BLM has been unable to design effective mitigations to allow for industrial activities within a caribou calving area despite a workshop specifically asked to consider this issue (Gilliam and Lent, 1982). Studies sponsored by ARCO Alaska, Inc. (Truett, Howard and Johnson, 1982) at Kuparuk oil field may eventually provide the answers required to design effective mitigations on or adjacent to a calving area, but there are no truly analogous examples known at present.

## B. Alternative B: Minimizing Presently Perceived Environmental Risk

Alternative B provides the most conservative interpretation of P.L. 96-514 directives.

### 1. When to Lease

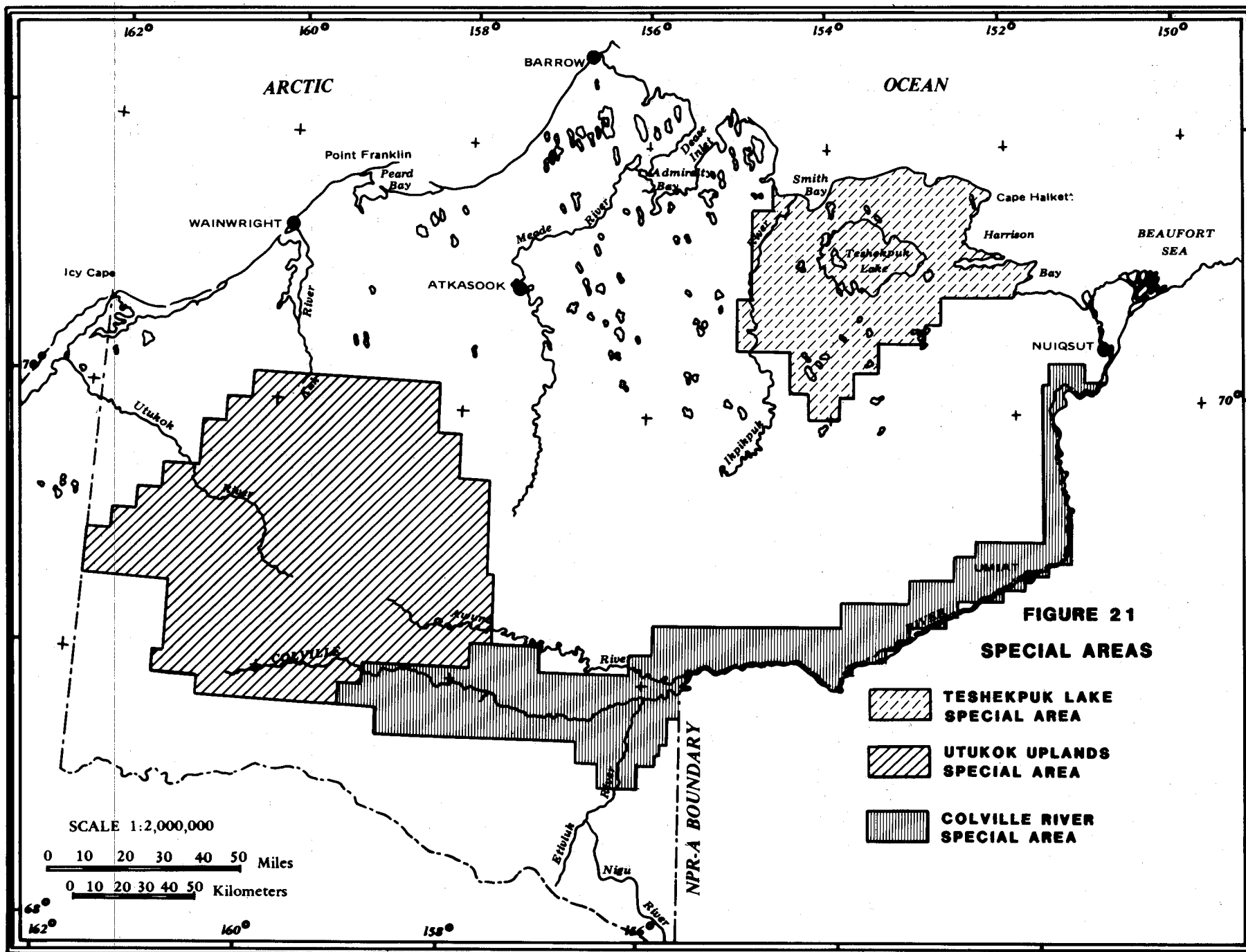
The first lease sale under Alternative B would probably be in late 1984. This would allow for completion of this EIS and an additional NEPA document that more specifically repeats the findings of this programmatic EIS for particular tracts and design of appropriate special lease stipulations for all areas of acceptable environmental risk. Special lease stipulations would be designed for all potential, not likely, impacts. The BLM also would design detailed application and compliance procedures. However, there would be no reoffering sales as such. Each sale would be preceded by a NEPA document on specific tracts similar to the EA process undergone for the first two NPR-A sales. This would continue until there was no need for further sales because either industry interest would have been exhausted or all acreage of acceptable environmental risk would have been identified by the NEPA document reviewers and offered for lease.

### 2. Where to Lease

Under Alternative B, all of the "special areas" designated in 1977 for special protections during Federal exploration (see Figure 21) and all Special Management Zones shown on Plate One would be deleted. The BLM would also administratively delete wild and scenic study river corridors and the AMNWR lands (see Plate One) despite any Congressional or FWS future actions which could make some of these areas available for leasing. Federal subsurface of any village lands also would be deleted and permanent Congressional withdrawal of deleted areas would be recommended. The only lands that would be available for leasing would be those tracts determined to be of acceptable environmental risk in a NEPA compliance document.

### 3. How to Lease

How to lease would be decided by a NEPA compliance document preceding each sale. Special lease stipulations describing environmentally acceptable ways of conducting petroleum related activities would be highlighted (see Figure 20). Surface occupancy and seasonal restrictions would be applied in any permitting process to avoid potential impacts by decreasing exposure of environmental values to industrial activities. Applicants would have to prove that their activity was designed to prevent significant impacts from their operations or potential accidents before permit approval.



° Advantages: Through the use of maximum deletions and individual NEPA documents, Alternative B would ensure that those in the public who feel that NPR-A petroleum development and maintenance of a quality environment are incompatible would be heard. The BLM could be straightforward with potential bidders on the restrictions on each tract before the sale. All successful bidders would be issued leases that already would have all potential environmental risks reduced to insignificant levels by stipulations. This shifts the burden of proof that impacts would be insignificant to the applicant. The BLM permitting process would become largely routine and would reduce BLM's workload and manpower requirement.

° Disadvantages: The requirement for individual NEPA documents for each sale could bog down an expeditious leasing process into a mire of procedural requirements and questions that would disregard the total public interest and the directives of P.L. 96-514. Large scale deletions under Alternative B would remove significant petroleum exploration and development opportunities. It could make petroleum development in NPR-A as envisioned by P.L. 96-514 uneconomical. In addition, if lands adjacent to leases issued in 1982 could not be offered due to deletions or the inability of a NEPA document to ever declare these lands of acceptable environmental risk, an economically producible unit may never be assembled. Designing special lease stipulations to minimize all potential impacts is beyond BLM's present capability. Stipulations that are too restrictive may not allow for innovative mitigations that may provide more effective protections. To delete all of the "Special Areas" and wild and scenic study river lands ignores NPR-A studies since 1977 that redefined the "Special Areas" and Congressional prerogatives and intents.

Requiring individual NEPA documents for each sale could be interpreted as an attempt to avoid a significant impact analysis by breaking down the leasing program into insignificant component parts. The argument that these additional EIS's would truly predict and quantify cumulative impacts is misleading because with the long lead times for exploration and development, there probably would not be any NPR-A oil developments to analyze during most of the leasing period. This programmatic Final EIS presents the significant impacts likely to occur. The accuracy of these predictions may be improved with a series of NEPA documents, but the significance of impacts would not change.

° Relative Environmental Risk: Of the three alternative leasing programs analyzed, Alternative B has the lowest relative risk of either singular or cumulatively significant impacts on NPR-A's high risk resources and issues because it would expose the least amount of land to industrial activity. Possible cumulatively significant impacts would be least likely under Alternative B because petroleum development envisioned by P.L. 96-514 is least likely.

C. Alternative C: Balancing Development Opportunity and Environmental Risk (The Preferred Approach)

Alternative C provides a moderate interpretation of P.L. 96-514 directives.

### 1. When to Lease

Alternative C meets P.L. 96-514 objectives through a series of five scheduled annual sales that would offer approximately two million acres (809,400 hectares) at each sale. Current estimates indicate that about 12 million acres (4.9 million hectares) of NPR-A must be offered to expose over 90 percent of the high potential oil and gas areas. The scheduled sales would meet these objectives at a pace considered reasonable by the petroleum industry. Unscheduled and reoffering sales would be scheduled as required to meet management objectives.

### 2. Where to Lease

A programmatic EIS identifies areas deleted from the leasing program and establishes a sale area selection process to precede each sale. Alternative C would offer tracts in all favorable areas shown on Figure 2. The specific tracts to be offered in each sale along with their appropriate special lease stipulations would be identified in the sale area selection process. The objective of each sale area selection process would be to promote expeditious leasing and development while mitigating reasonably foreseeable and significantly adverse effects. If further information or analysis so indicates, certain tracts may be deferred to future sales during tract selection. Deletions other than those recommended in a programmatic EIS would not be considered.

### 3. How to Lease

Alternative C would employ a tiering approach to mitigation. A programmatic EIS would review past NPR-A stipulations for possible future use (see Figure 20) and identify any new mitigations applicable as special lease stipulations or recommended for use in a permitting process. Each sale area selection process would review the EIS for consistency but could require other special lease stipulations for particular tracts, if appropriate to conserve high environmental values. The permitting process would be restricted to site- and activity-specific restrictions and would require specific NEPA compliance documentation. The BLM and Lessee would be required to cooperatively plan for effective mitigations to avoid significant impacts.

Advantages: Alternative C presents a measured approach to leasing and provides an opportunity for the BLM, the petroleum industry, the State of Alaska and local governments to help "direct" the leasing program before each sale. By providing all NEPA compliance for leasing in one programmatic EIS, the significance of the action cannot be ignored or broken down into insignificant parts. The BLM would be able to be sufficiently straightforward with industry concerning environmental restrictions through special lease stipulations assigned to tracts before sale. Alternative C administratively deletes only those areas where the BLM has been unable to design any reasonable mitigations to allow for development. This alternative will continue the past cooperative efforts of the BLM and the petroleum industry to allow for petroleum discovery and extraction while conserving other NPR-A resources under a multiple use management ethic. Impacts on NPR-A surface resources would still occur but their level should be manageable with respect to the public interest defined by P.L. 96-514.

° Disadvantages: Alternative C excludes immediate development of oil potential in less than 10 percent of NPR-A's lands and a minor percentage of potential petroleum value in order to conserve high environmental values. If comments from the petroleum industry on the Draft EIS have been interpreted correctly, Alternative C's level of environmental conservation stipulations may be too restrictive and may increase cost of NPR-A development over the economic cost of development incurred at Prudhoe Bay and Kuparuk oil fields.

° Relative Environmental Risk: Alternative C has moderate but manageable relative risks of both singular and cumulatively significant impact compared to Alternatives A and B. Alternative C allows mitigations to be designed and applied at both the leasing and permitting levels to maintain regional and site-specific perspectives. By deleting two areas where effective mitigations cannot be presently designed and designating Special Management Zones to encompass areas of diverse and sensitive habitats and uses that will require careful mitigative design, Alternative C would minimize potential impacts of singular and cumulative significance. By requiring BLM and Lessee cooperation in the design of effective mitigation for any NPR-A petroleum related activity, Alternative C provides reasonable methods of minimizing impacts including those that threaten continuing subsistence uses. Specific impacts would be similar to those discussed in Chapter Five.

## II. IDENTIFYING THE PREFERRED ALTERNATIVE

The most important purpose of this EIS process is to help the BLM, acting for the Department of the Interior, to make better decisions. The preceding EIS analyses are specifically directed towards a final goal of identifying the Preferred Alternative NPR-A leasing program mandated by P.L. 96-514. The specifics of the selected NPR-A leasing program will be presented in the BLM State Director for Alaska's "Record of Decision" to be released 30 days after publication of this FEIS. The following presentation of the Preferred Alternative, based on the EIS analyses, is recommended as the optimum leasing program. It represents the best balance of offering high potential oil and gas areas while conserving the other resources of NPR-A.

### A. Sale(s) Location

All future NPR-A lease sales will be in Anchorage. Competitive oil and gas leasing is a function of the BLM Alaska State Office in Anchorage and represents the most practical location in terms of logistics and cost savings to the government.

### B. Sale(s) Date(s)

#### 1. Scheduled Sales

Scheduled sales will be held in July of 1983, 1984, 1985, 1986 and 1987.

#### 2. Sales Beyond 1987

Sales beyond 1987 will be scheduled as necessary to meet management objectives.

July 1983 has been selected for the first sale to allow time for this EIS to be completed, the BLM State Director for Alaska's "Record of Decision" on the selected leasing program to be released, the sale area selection process to be completed, the wording of Special Lease Stipulations to be finalized and a Notice of Sale to be published. It was established as the best date for other scheduled sales to allow a full year to complete pre-lease sale requirements. Sales beyond 1987 will probably be required but are currently unscheduled. Post-1987 sales will be held, as necessary, to react to new geophysical data, discoveries or new nomination processes.

### C. Presale Procedures

These are standard BLM procedures. The following descriptions detail how they will be carried out in the NPR-A leasing program. Similar procedures on similar time frames will precede all unscheduled sales beyond 1987.

#### 1. Calls for Nominations

These will be made only as necessary to make sure that lease sale offerings are responsible to the petroleum industry interests. If required, calls for nominations will be held in January of the year preceding a sale (that is, if a nomination is held in January 1984, it will be for the July 1985 sale).

#### 2. Sale Area Selection

This will be based on a variety of information sources. The BLM will provide everyone the opportunity to comment on the selection of areas to be offered by briefings to the State of Alaska, local governments and through information provided to the general public. Sale area selection will be conducted in April of the year preceding a sale (that is, sale area selection in April of 1983 will be for the July 1984 sale). Sale area selection for the July 1983 sale began in August 1982 and included the required briefings and provision of maps to the public.

#### 3. Special Lease Stipulations

Reviewed annually as a part of the sale area selection process for proper assignment to specific lease tracts, these special stipulations will reflect the findings of this EIS. Assignment of special lease stipulations to specific tracts will be completed by January of the year of sale.

#### 4. Notice of Sale

The notice to be released by June of the sale year will contain all sale conditions, requirements and stipulations.

### D. Postsale Procedures

Bid review, bid acceptance or rejection, Department of Justice review and lease award to successful bidders will be accomplished by October following each July sale. Procedures for unscheduled sales beyond 1987 will be similar.



E. New Acreage Objectives

With present knowledge of the high potential oil and gas lands within NPR-A, the BLM estimates it will offer 12 million acres (4.8 million hectares) for lease before the currently known best potential areas are leased. The majority of these high interest lands will have been offered by the end of the scheduled sales. However, new information may require sales beyond 1987 to meet management objectives. All acreage to be offered must be considered in the sale area selection process preceding each sale.

A two-million-acre objective for scheduled sales was derived from a review of current BLM manpower and workload projections.

1. Scheduled Sales

Sales scheduled from 1983-1987 will offer an average of two million acres (809,400 hectares) of previously unoffered acreages per sale.

2. Sales Beyond 1987

Such sales will continue to offer new acreage in response to new nominations, geophysical data, or discoveries to meet management objectives.

F. Reofferings

Unsold tracts, beginning with those not leased in the July 1983 sale, may have to be reoffered in response to improved oil and gas resource information. Any unsold tracts to be reoffered will be shown as such on the lease tract map preceding the sale. These reofferings will be reviewed in the sale area selection process to insure that previously assigned stipulations remain appropriate.

1. Scheduled Sales (1983-87)

Beginning in July 1984 scheduled sales may reoffer any unsold tracts in addition to the two million acres (809,400 hectares) of previously unoffered acreage if required to meet management objectives.

2. Sales Beyond 1987

These may also reoffer any unsold tracts in addition to new acreage if required to meet management objectives.

G. Administrative Deferral of Leasing (see Plate One)

1. Fish Creek Delta and Adjacent Salt Marshes

Fish Creek delta and adjacent salt marshes (all NPR-A lands within T13N R2E, T13N R3E, T13N R4E, T12N R2E, T12N R3E, T12N R4E) will not be offered until the July 1987 sale to allow the U.S. Fish and Wildlife Service the opportunity to complete ongoing ecological studies.

## 2. Federal Subsurface of Village Lands

The Federal subsurface of village lands surroundings Barrow, Atkasuk, Nuiqsut and Wainwright will not be offered for lease until the Arctic Slope Regional Corporation has exhausted subsurface selection rights under Section 1431(o) of the Alaska National Interest Lands Conservation Act.

### H. Administrative Deletions From Leasing (see Plate One)

#### 1. The Western Arctic Caribou Herd Central Calving Area-Utukok Uplands

As shown on Plate One, this area will be administratively deleted from the leasing program because its known environmental value outweighs the presently perceived oil and gas potential.

#### 2. The Highest Density Black Brant Molting Area

As shown on Plate One, these areas will be administratively deleted from the leasing program because its known environmental value outweighs the presently perceived oil and gas potential.

#### 3. Restoration of Deleted Areas to the Leasing Program

Restoration of deleted areas to the leasing program may occur as a result of studies which show:

a. The area is no longer critical to the life-cycle of caribou or black brant;

b. Studies of analogous situations have demonstrated a high degree of compatibility of calving caribou and molting black brant with oil and gas activities; or

c. New resource estimates and Department of the Interior directives establish that potential oil and gas values outweighs potential environmental losses.

d. Prior to removing any area from an administrative deletion the BLM will:

- ° Inform the public that lands previously deleted are being reconsidered for leasing and give the reasons for the reconsideration;
- ° Summarize for the public the impact discussions from this Final EIS and any new material;
- ° Respond to public comments and concerns in a formal "Record of Decision"; and
- ° Select appropriate stipulations.

### I. Special Lease Stipulations

#### 1. "Standard Requirements"

As shown on Figure 20 and used in NPR-A lease Sale 822 (May 26, 1982), these will continue to be used with appropriate minor modifications and attached to the appropriate lease tracts prior to each sale.

## 2. Special Management Zone (SMZ)

Stipulations (Chapter One, C.3.) will be assigned to all tracts encompassing any Special Management Zone shown on Plate One. Coastal SMZ's on the Chukchi Sea extend two miles inland from the boundary of the Alaska Maritime National Wildlife Refuge. Coastal SMZ's on the Beaufort Sea coast are as shown including all barrier islands within the NPR-A and two miles onshore at Elson Lagoon, mouth of the Kalikpik River and the Fish Creek delta and salt marsh area.

## J. The NPR-A Permitting Process

### 1. Surface Occupancy Restrictions

Surface occupancy restrictions may be made on a site-specific basis during the permitting process. These restrictions will be applied to protect small areas of known high value fish and wildlife use, subsistence use or historical and archaeological values known to be incompatible with the proposed activity. They will not be applied in such a manner that eliminates all Lessee access to possible subsurface petroleum resources on a lease.

### 2. Seasonal Restrictions

Seasonal restrictions in addition to present lease stipulations (Figure 20) may be applied in a permitting process if required to conserve project area fish and wildlife seasonal uses.

### 3. The Design Solution Concept

The Design Solution Concept of cooperation between the BLM and a Permittee will be carried out in all aspects of the permitting process. With the reorganization within the Department of the Interior, the BLM has acquired full permitting control of all NPR-A activities including the issuance of Application for Permit to Drill (APD).

Acting in the total public interest, the BLM will not make permitting decisions based on inadequate information concerning probable effects or incomplete project descriptions. The BLM will work with all permit applicants to ensure that permitting decisions for the NPR-A are based on adequate applicant analyses of proposed project specifics and reasonably foreseeable effects. Decisions will incorporate the best designs and mitigations and be issued in a timely manner.

## K. Native Allotments and Village Lands Surface Estates

The BLM will not issue any permit requiring the occupation of Native allotment or village land surface to extract Federal subsurface minerals until the Permittee establishes that the surface owner has been contacted and agrees to such use in the form of a surface use lease.

L. Conservation of Subsistence Use

The BLM recognizes the need to conserve subsistence uses of the NPR-A. Currently adopted special lease stipulations to conserve subsistence uses will be retained. Permitting stipulations may also be required and will be applied to protect site-specific subsistence activities in the vicinity of proposed projects. The BLM will not issue any permitting stipulations or rulings categorically prohibiting traditional means of access through a project area or prohibiting traditional subsistence uses within a project area. The BLM may consent to rulings prohibiting the discharge of firearms within a reasonable distance of a project area to promote public safety.

The identification of major subsistence rivers on Plate One represents a first step in the identification of subsistence use areas for assignment of appropriate lease and permitting stipulations. The BLM intends to continue working with the people of the North Slope to identify subsistence use areas so that they may be afforded adequate protections from potential petroleum activity impacts.

M. Recognition of Current Withdrawals From Leasing

1. Wild and Scenic Rivers Study

Wild and scenic study rivers (the Colville, Utukok and Etivluk-Nigu Rivers) are currently withdrawn from the leasing program to enable Congress to decide by September 1984 if they should become a part of the wild and scenic river system.

Until September 1984, all lands within two miles of designated reaches of these rivers are withdrawn from the NPR-A leasing program. If Congress designates any study river reach as a wild and scenic river, then all lands within one mile of the so designated reaches will be permanently withdrawn from the leasing program and the BLM will manage them as wild and scenic rivers.

If Congress takes no action by September 1984 or chooses to exclude certain river reaches from wild and scenic river designation, they will become leaseable with appropriate leasing and permitting stipulations.

2. Alaska Maritime National Wildlife Refuge

Alaska Maritime National Wildlife Refuge lands on the Chukchi Sea coast are withdrawn from leasing consideration until the U.S. Fish and Wildlife Service performs the compatibility test required on all refuge lands. The U.S. Fish and Wildlife Service is recognized as the land manager of these Chukchi Sea coastline areas.

N. Specific Requirements for Further National Environmental Policy Act (NEPA) Compliance

1. All Permitting Processes

All permitting processes on the NPR-A will require further NEPA compliance documentation.

## 2. All Rights-of-Way

All rights-of-way proposals showing alternative routings across areas remaining in a deleted status at the time of right-of-way proposal will require further specific NEPA compliance documentation.

## 3. All Proposals to Grant Public Access

All proposals to grant public access to roads or airstrips on the NPR-A built under BLM permit in support of petroleum exploration, development or production activities will require further specific NEPA compliance documentation.

## 0. Cooperative Studies

The BLM has identified the need for further studies to aid in the management of the Reserve.

### 1. BLM Sponsored

The BLM will continue to monitor the recovery of the endangered peregrine falcon population using portions of the NPR-A.

### 2. Cooperative Agreements

The BLM recognizes the expertise of many other governmental agencies and organizations which have allowed for the collection of much of the NPR-A resources information presently known. In particular, the BLM recognizes the fish and wildlife resource study capabilities of the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service; the pollution control study capability of the Alaska Department of Environmental Conservation; and especially the subsistence use site identification capability of the North Slope Borough and other agencies.

The BLM will seek funding to enter into cooperative agreements to continue assessments of NPR-A resources.

### 3. BLM/Lessee Studies

The BLM and Permittee will cooperatively study the specific effects of any proposed project in the permit application stage and by monitoring the authorized activity.

## P. Continuing Coordination

The BLM as a responsible land managing agency is clearly aware of its legal responsibilities to coordinate all its regulatory functions with other Federal agencies, the State of Alaska, the North Slope Borough and, if necessary, with village governments. However, as a part of this leasing program, the BLM intends to go beyond its regulatory requirements and actively seek out the offered assistance and expertise of offices and individuals within the petroleum industry, the Federal, State and local governments, universities and environmental conservation groups to help the BLM make better decisions.

### III. THE NO ACTION ALTERNATIVE

The no action alternative, no further leasing within NPR-A, is not viable under the mandate to institute an NPR-A leasing program established by P.L. 96-514, the Department of the Interior Appropriations Act of 1981.

### IV. RESIDUAL IMPACTS TO HIGH RISK RESOURCES AND ISSUES UNDER THE PREFERRED ALTERNATIVE

The magnitude and severity of impacts will be reduced under the Preferred Alternative, but some level of residual impacts may remain even after application of the best possible mitigation. This discussion will focus on the likely environmental "price" of petroleum development of the NPR-A following leasing under the Preferred Alternative.

#### A. Caribou

With the deletion of the central calving area and the additional protections of SMZ to encourage caribou conservation (Plate One), no catastrophic influences on the natural cycling of caribou populations on or adjacent to NPR-A are expected. It is likely, however, that caribou behavior and traditional distribution patterns will alter to some degree and may be attributable to new industrial activities within their range. It is felt that with the required "freedom-of-passage" stipulations on any industrial activity, expected changes in caribou behavior in most years will not influence herd recruitment or population levels. However, in years of natural lows in caribou populations, the tendency of caribou to avoid areas of industrial activity and remain in undisturbed areas may influence subsistence availability.

#### B. Grizzly Bear

Even with the additional protections of SMZ (Plate One), leasing leading to development in southern NPR-A would result in the destruction of habituated grizzly bears in the interest of public safety. Over the life of a project in southern NPR-A (20-40 years) these losses to protect public safety despite all efforts at limiting human/bear confrontations may be measurable as a population decline.

#### C. Polar Bear

The application of SMZ (see Plate One) along the coastlines of NPR-A will afford special conservation considerations to the maintenance of onshore winter maternity denning. However, since the significance of onshore habitat to maintenance of polar bear populations is not known, it is not known if any alteration of this poorly mapped habitat use would be of any significance. Destruction of occasional marauding polar bears at coastal development sites in the interest of public safety is likely but is not expected to be measurable at the population level.

#### D. Geese

With the application of the SMZ, deletion of the highest density black brant molting area, and application of appropriate stipulations required under the Preferred Alternative (see Plate One), no measurable impacts at the goose or waterbird population level are expected from NPR-A petroleum development.

#### E. Peregrine Falcon

With the Preferred Alternative's provisions of SMZ (see Plate One) encompassing the highest nesting density on NPR-A and the provisions of the Endangered Species Act, no petroleum development in NPR-A will directly influence the productivity of the endangered peregrine falcon.

#### F. Other Cliff-Nesting Raptors

As with the peregrine falcon, the nesting success and productivity of other cliff-nesting raptors may dramatically decrease in direct proportion to any increase in human disturbance near nest sites. Unlike peregrine falcons which receive special consideration under the Endangered Species Act, other cliff-nesting raptors may be directly impacted by poorly stipulated petroleum development activities. The establishment of the SMZ along the Colville River (see Plate One) and in southwestern NPR-A will help conserve much of these birds' habitats. The use of surface occupancy and seasonal restrictions in the permitting process as recommended in the Preferred Alternative should also help eliminate or minimize impacts. Therefore, it is not expected that any residual impacts would be of long-term population significance.

#### G. Fisheries

The Preferred Alternative recognizes the importance of NPR-A's fishery resources to the subsistence lifestyle and as a natural resource. The identification of major subsistence rivers and the use of special lease stipulations aimed at protecting subsistence fisheries and the subsistence lifestyle will continue. The use of seasonal and site-specific surface occupancy restrictions, special facility siting requirements and adequate oil spill response and clean-up procedures will be stressed in the permitting process. It is not expected that the controlled leasing or authorization of petroleum activities on the NPR-A will lead to significant impacts on fisheries. However, because of the susceptibility of aquatic systems to oil spills resulting from accidents or sabotage, and despite spill control and clean-up efforts, short-term localized impacts on fisheries are expected.

#### H. Sociocultural and Subsistence Issues

The summary of potential beneficial and adverse impacts given in Table 23 remains largely unchanged in a residual impact analysis. Leasing under the Preferred Alternative will conserve the resources of the subsistence lifestyle but will not halt the lifestyle stresses currently affecting North Slope residents. NPR-A developments will increase the tax base of the North Slope Borough encouraging its goals of full employment and modernization of village infrastructures. However, it may also increase the alienation among North Slope residents unless the adaptability and resiliency their society has historically shown can overcome even greater changes.

#### I. Recreation and Primitiveness

The Preferred Alternative and the intended multiple use management of the Reserve recognize the potential adverse impacts of indirectly increasing recreational access to the NPR-A: increased sport hunting and fishing, disturbance to peregrine falcon, increased need for facilities, etc. It also

recognizes the present primitive character of NPR-A. Therefore, in the absence of any present directive to increase recreational access to NPR-A, the Preferred Alternative will not consider any proposal to open any petroleum industry road or airport to public use without specific analysis of potential impacts that may be additive to any ongoing industrial development. Present recreational access to NPR-A, mainly by small aircraft to unrestricted landing areas, will be allowed to continue at the presently manageable level. The off-duty recreational activities of petroleum industry workers will be restricted if appropriate, in the permitting process. Since there will be no wilderness designations in the Reserve and if there is no establishment of wild and scenic rivers in the Reserve, the BLM will treat the maintenance of the primitive quality of the NPR-A as a legitimate multiple use parameter to be conserved along with all other NPR-A resources in the permitting process. There will be no residual impacts to the present recreational uses of NPR-A, but there may be impacts to its primitive quality in the public perception.

#### V. SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

For the purposes of this discussion, any production of petroleum from the NPR-A must be considered a legitimate short-term use even though production may continue from 10 to 50 years under BLM's multiple use management directives. Conversely, the fish and wildlife resources and subsistence lifestyle of the people of the North Slope represent long-term use. There would be little if any loss in long-term productivity associated with continuing petroleum exploration of the NPR-A. No permanent roads would be built for exploration and only very small areas of habitat would be altered even with all-season exploratory well pads and airstrips.

However, if exploration results in economic oil discoveries, it is likely that petroleum production facilities, including permanent road and cross-country pipelines, would be established. Although any effects are thought to be controllable under this EIS's Preferred Alternative for the leasing program and the BLM's permitting/monitoring process, changes in long-term biological productivity and the current subsistence lifestyle are expected but cannot be accurately determined to be of any significance in this pre-leasing EIS. If any development resulted in modification of migration routes or traditional fish and wildlife use areas, the long-term productivity of the habitat may not be degraded, but the productivity of the fish and wildlife populations, through disturbance, may be.

A more serious threat to long-term productivity stems from the indirect effects of petroleum development on the NPR-A: increased unrestricted public access to a formerly remote portion of Alaska. Overuse of fish and game resources by competition between North Slope Borough residents and non-residents given increased access via roads is a real possibility. Shortages of fish and game resources in the vicinities of North Slope villages has been repeatedly mentioned in public meetings for NPR-A programs since 1977. These shortages are most often attributed by North Slope residents to petroleum exploration of the Reserve, especially to use of explosives in geophysical surveys. While the destructive effects of poorly controlled seismic methods using explosives cannot be denied, their effect on long-term productivity cannot be considered major. Declines in the amount of harvestable resources in the vicinity of villages may be linked to the changes in harvest patterns resulting from the abandonment of historic nomadic patterns



of living and subsistence harvest to the present sedentary existence in villages.

The BLM using multiple use directives and working with the petroleum industry, the State of Alaska and the North Slope Borough, will not allow petroleum development to destroy other legitimate uses of NPR-A. All uses of the land is NPR-A consistent with multiple use goals and conservation of long-term productivity will be considered in any decision for NPR-A's management.

#### VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The human and financial resources committed to exploration and production would be lost in an opportunity cost sense. By opportunity cost, economists mean the value of goods and services which could have been produced if the human and financial resources dedicated to oil and gas development had gone instead to other productive sectors of the economy.

Similarly, the energy used in exploration, construction and field operation also would be lost. The financial resources that would be committed to NPR-A oil development would be considerable should commercial production result. For illustrative purposes, three fields analyzed in terms of their capital requirements are shown below (see Table 24 and Figure 22).

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T A B L E 24  
Fields For Opportunity Cost Analysis

<u>Illustrative Fields</u>	<u>Number of Wells</u>	<u>Estimated Capital Costs</u> (1982 dollars)
Tukuto Creek	92	\$ 1,685,100,000
Liberator	149	2,729,200,000
Prince Creek	149	1,225,900,000
Total of 3 Fields	390	\$ 5,640,200,000

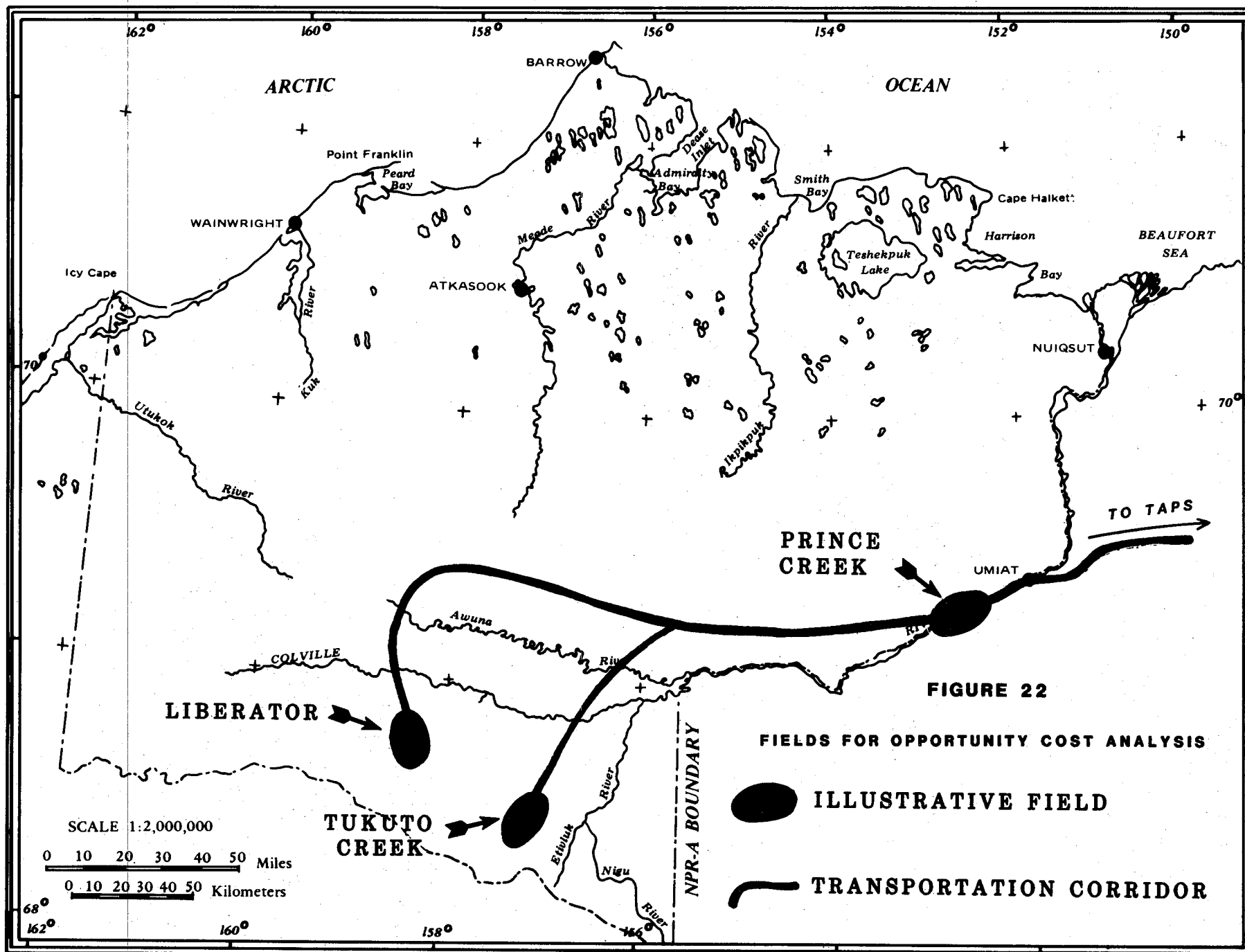
Source: Shepard et al. 1982

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Any oil or gas produced from NPR-A leases would be a final commitment of non-renewable resources.

Final commitments of other NPR-A resources may or may not be made with authorization of petroleum development depending on the viewpoint taken.

In the view of some, any activity on NPR-A will affect its primitive quality. Despite screening to maintain visual resources and conservation of renewable resources during operation and rehabilitation to some level of productivity, although not necessarily to original condition upon abandonment, the primitive character may be totally lost to some observers. In the view of the BLM, implementation of the Preferred Alternative and use of a multiple use management method will prevent final adverse commitments of renewable resources while allowing for possible oil and gas production from NPR-A.



Source: Shepard, et. al., 1982

VII. NOTES ON THE POSSIBLE ENVIRONMENTAL RISKS OF CONCURRENT DEVELOPMENTS  
ON THE NORTH SLOPE OF ALASKA

The preceding EIS discussions analyze possible effects on all high risk resources or issues on or adjacent to NPR-A. The impact analyses in this document satisfy the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) guidelines for the proposed action. All permit applications for proposed activities on NPR-A will require further NEPA compliance.

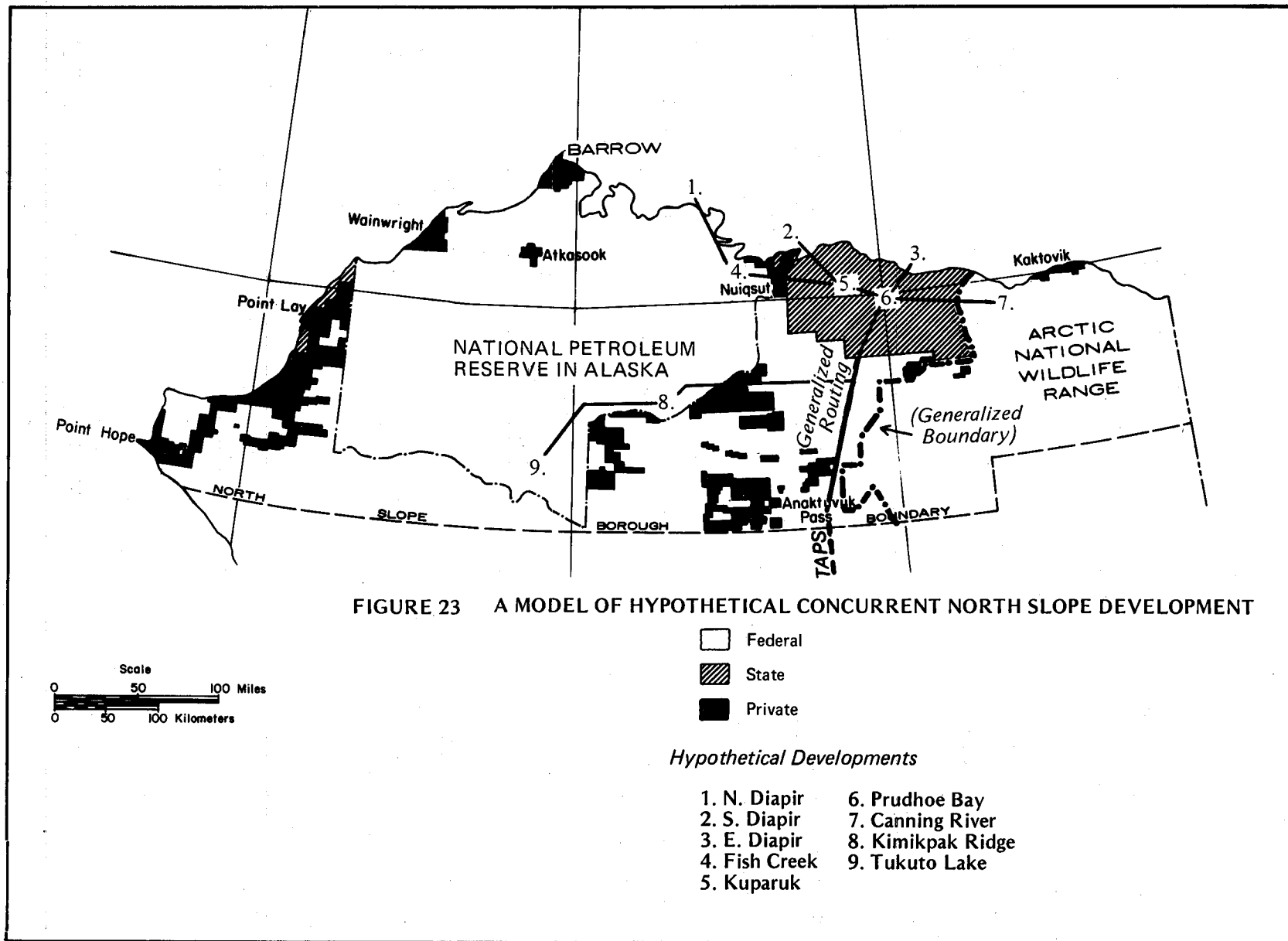
However, the BLM understands the concerns of Draft EIS commentators about possible cumulative impacts across the North Slope. Fish and wildlife values and other issues do not recognize man's administrative boundaries. Oil and gas leasing, exploration, development or production is occurring or is anticipated to occur under Minerals Management Service (MMS), BLM, the U.S. Fish and Wildlife Service, the State of Alaska and the Arctic Regional Corporation/North Slope Borough primary jurisdictions. Assessment of these concurrent activities is truly beyond the scope of this EIS and BLM directives. This task could be adequately done only by an interagency Federal/State/local task force. Because the BLM realizes that it should be a participant in this process, a modest, simplistic model of possible concurrent development has been included in this EIS. This model assigns fictitious names to hypothetical fields chosen to illustrate where significant clusters of leases could exist, where production could occur or where exploration interest is highest. It is assumed that all oil produced (gas production is not considered) is sent to markets via the Trans Alaska Pipeline System (TAPS). A haulroad is assumed to parallel the schematic pipeline routings shown on Figure 23. Table 25 is a matrix of possible environmental risks. This modeling has no basis in the literature and has been constructed by the EIS team as an informational tool.

T A B L E 25  
A Matrix of Possible Concurrent Environmental  
Risks on the North Slope

Possible Environmental Risks ***** Hypothetical Developments *****	Caribou				Grizzly Bear	Polar Bear	Water- birds	Peregrine Falcon
	WAH	TLH	CAH	Porcupine				
1. N. Diapir						X	X	
Corridor 1-4		X				X	X	
2. S. Diapir						X	X	
Corridor 2-5			X			X	X	
3. E. Diapir						X	X	
Corridor 3-6			X			X	X	
4. Fish Creek		X				X	X	
Corridor 4-5		X	X			X	X	
5. Kuparuk	-	-	-	-	-	-	-	-
Corridor 5-TAPS	-	-	-	-	-	-	-	-
6. Prudhoe Bay	-	-	-	-	-	-	-	-
Corridor 6-TAPS	-	-	-	-	-	-	-	-
7. Canning River			X			X	X	
Corridor 6-7			X	X		X	X	
8. Kimikpak Ridge	X				X			X
Corridor 8-TAPS	X		X		X			X
9. Tukuto Lake	X				X			
Corridor 8-9	X				X			X

TABLE 25 (cont'd)  
A Matrix of Possible Concurrent Environmental  
Risks on the North Slope

Possible Environmental Risks ***** Hypothetical Developments *****	Other Raptors	Freshwater Fishery	Marine Resources	Sociocultural and Subsistence Issues						
				Pt. Hope	Wainwright	Barrow	Atkasuk	Nuiqsut	Kaktovik	Anaktuvuk Pass
1. N. Diapir			X			X		X		
Corridor 1-4		X	X			X		X		
2. S. Diapir			X			X		X		
Corridor 2-5		X	X			X		X		
3. E. Diapir			X					X	X	
Corridor 3-6		X	X					X	X	
4. Fish Creek		X				X		X		
Corridor 4-5		X				X		X		
5. Kuparuk	- - - - -	- - - - -	- E X I S T I N G -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Corridor 5-TAPS	- - - - -	- - - - -	- E X I S T I N G -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
6. Prudhoe Bay	- - - - -	- - - - -	- E X I S T I N G -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Corridor 6-TAPS	- - - - -	- - - - -	- E X I S T I N G -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
7. Canning River		X						X	X	
Corridor 6-7		X						X	X	
8. Kimikpak Ridge	X	X				X		X		X
Corridor 8-TAPS	X	X				X		X		X
9. Tukuto Lake		X								X
Corridor 8-9	X	X				X		X		X



Current Land Status on the North Slope (T.A. or Patent)

## CHAPTER SIX. CONSULTATION AND COORDINATION

### I. INTRODUCTION

This chapter includes a discussion of the consultation and coordination completed in support of this EIS and lists the Final EIS preparers.

### II. DRAFT EIS CONSULTATION AND COORDINATION

During the preparation of the Draft EIS, the BLM consulted or coordinated with the public, the oil and gas industry, environmental groups, other Federal agencies, the State of Alaska and the North Slope Borough. This consultation and coordination occurred in two phases. Phase One occurred in early 1982 when the scope of the Draft EIS was determined through the Scoping Document for Future Oil and Gas Leasing in NPR-A (USDI, 1982) and a series of statewide public meetings. A summary of comments received is presented in Tables 2 and 3 (Chapter One).

Because Phase Two, the Draft EIS, was initiated in May 1982 and released in October of 1982, BLM took an unusual approach to consultation and coordination. Workshops were held with experts on caribou and waterbirds, peregrine falcon researchers were consulted, and meetings were held with operations managers of major oil companies in Alaska to solicit innovative concepts for design and operation of hypothetical oil production facilities. Those who would have been formally consulted in a normal EIS process already had been drawn into a prepublication review and critique of assumptions for the Draft EIS. These individuals and organization were:

#### Operational Experts From Industry

S.J. Borys, EXXON, USA  
Dallas Cross, Alaska United Drilling  
Joe Downey, Nabors Alaska Drilling  
Jim Storet, USGS/Husky Oil  
Khoi Mi Le, ARCO  
AK  
M. G. Waki, Chevron Oil  
Alaska Gas and Service  
Roger Herrera, Sohio  
O. K. Gilbreth, AOGA  
CO  
Pete Nelson, Texaco  
Jim Dosch, Conoco  
James Buck, ARCO  
R. C. Heintz, ARCO  
Kevin Tabler, Union Oil  
Dennis Lohse, Shell  
R. W. Elkins, Cities Service Co.  
Keith McCleary, AMOCO Production Co.  
W. D. Saver, Chevron USA  
George Petering, Placid Oil  
Don Hartman, Texaco  
D. E. Galloway, EXXON, USA

#### Academics, Consultants and Professionals Having Special Expertise in Impact Analyses

Dr. Allen Jubenville, Professor of  
Recreation, U of A, Fairbanks, AK  
Ed Phillips, State Mineral Economist,  
DMEM, State of Alaska  
Dr. David W. Norton, U of A, Fairbanks,  
AK  
Jim Davis, ADF&G, Fairbanks, AK  
Staff, Office of Special Projects, BLM  
Staff, Resources, BLM, ASO  
Staff, EPA, Anchorage, AK and Denver,  
AK  
Staff, USGS, Reston, VA, Anchorage, AK  
and Seattle, WA  
Minerals Management Service,  
Anchorage, AK  
North Slope Borough Staff, (NSB)  
Anchorage and Barrow, AK  
Dr. John Olson, Tetra Tech Consultants,  
Anchorage, AK  
Biologist, Institute of Water Resources,  
University of Alaska, Fairbanks, AK  
Staff, Alaska State Subsistence Division  
Dr. Dirk V. Derksen, USF&WS, Anchorage, AK

Academics, Consultants (cont'd)  
and Professionals Having  
Special Expertis in Impact  
Analyses

Dr. Joe C. Truett, LGL Ecological Research Assoc., Grand Junction, CO	Members of Ukpeagvik Inupiat Corporation History, Culture, Language Dept., NSB
Dr. Wayne Hanson, Dames & Moore Consulting Engineers, Anchorage, AK	Environmental Protection Office, NSB
Rosa Meehan, USF&WS, Fairbanks, AK Research	Dr. David W. Norton, U of A, Fairbanks, AK
Phil Koehl, ADF&G, Anchorage, AK	David G. Roseneau, LGL Ecological Assoc., Fairbanks, AK
Thomas Rothe, USF&WS, Anchorage, AK	North Slope Borough Fish and Game Management Committee
Dr. R. D. Cameron, ADF&G, Fairbanks, AK	Dr. Peter Lent, USDI, BLM Washington, D.C.
Dr. David Klein, USF&WS, Fairbanks, AK	Jim Curatolo, Alaska Biological Research, Fairbanks, AK
Skip Ambrose, Raptor Biologist, USF&WS, Fairbanks, AK	

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Professionals assigned to the Draft EIS contacted specialists within the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service and other wildlife researchers regarding potential impacts to biological resources.

The University of Alaska, Fairbanks, provided comments on NPR-A recreation opportunities.

Researchers conducting studies of nutrient cycling in Arctic waters were contacted regarding their unpublished findings.

Operations managers of Canadian firms provided information regarding gravel conserving techniques being used in field development in the Canadian Arctic.

Information was gathered from consulting firms working on comprehensive land use plans for Arctic Alaska for the State of Alaska and the North Slope Borough, Eskimo whaling captains were contacted regarding their decisions on best uses of habitat zones (land classification) and insights into issue resolution (impact mitigation techniques).

Officials of Cominco, a mining company planning a mine south of the Brooks Range with a road to a coastal port, were contacted to see if their plans might link to transport of supplies to NPR-A or shipment of crude oil from the Reserve.

### III. FINAL EIS CONSULTATION AND COORDINATION

Final EIS consultation and coordination was accomplished in three phases. Phase One, public meetings and hearings, was completed on December 13, 1982. Phase Two, receipt of timely Draft EIS comments was accomplished between December 10, 1982 and December 23, 1982. Phase Three, continuing coordination with agencies and individuals interested in the NPR-A decisionmaking process, has been ongoing since the late 1970's and will continue after release of this Final EIS.



A. Public Meetings and Hearings

Between the release of the Draft EIS (October 1, 1982) and the close of the Draft EIS comment period (December 10, 1982), the BLM EIS team held public meetings throughout Alaska to inform the public of the Draft EIS findings and to receive comments. BLM representatives met with the public in meetings held in Nuiqsut (November 8, 1982), Wainwright (November 8, 1982), Atkasuk (November 9, 1982), Kotzebue (November 15, 1982), Anchorage (November 29, 1982), Fairbanks (December 1, 1982), Barrow (December 2, 1982) and Anaktuvuk Pass (December 13, 1982). Attempts to schedule a public meeting at Point Lay were unsuccessful. A summary of substantive comments from these public meetings is included in the attached Consultation and Comment Appendix. All comments received have been utilized in preparing this Final EIS.

On November 22, 1982, the BLM Associate State Director for Alaska, accompanied by BLM personnel from the Fairbanks District Office and the EIS team, conducted a formal public hearing in compliance with Section 810 of ANICLA. The hearing was held with the assistance of the Western Committee, Arctic Regional Council to solicit formal testimony as to how the NPR-A leasing may beneficially or adversely affect the current lifestyle and subsistence uses of North Slope residents. A formal transcript of the hearing was taken, and limited copies are available from the BLM Alaska State Office (912), 701 C Street, Box 13, Anchorage, AK 99513. The Consultation and Comment Appendix at the back of this EIS contains an informal summary of testimony received.

B. Response to Comments on the Draft EIS

Written comments on the Draft EIS were received from October 1, 1982 to December 23, 1982. The majority of changes in this EIS from draft to final version were made in response to these oral and written comments. In responding to written comments, the BLM has followed the CEQ guidance regarding Specificity of Comments (40 CFR 1503.3):

When a commenting agency criticizes a lead agency's predictive methodology, the commenting agency should describe the alternative methodology which it prefers.

CEQ guidance for response to comments is contained in 40 CFR 1503.4. The BLM continued the use of brevity in response to all letters of comment which were examined and substantive comments extracted and responded to in the Consultation and Comment Appendix.

The following submitted Draft EIS comments in a timely manner:

North Slope Borough  
Eugene Brower

Village of Wainwright  
Rossman E. Peetook, et al.

North Slope Borough  
Arnold Brower, Jr.

City of Barrow  
Nate Olemaun, Mayor

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Sierra Club  
Sally Kabisch, Assistant Alaska  
Representative

Trustee for Alaska  
Eric Smith, Executive Director

National Audubon Society  
David R. Cline, Regional Vice  
President

John R. Swanson  
Berkeley, California

Alaska Center for the Environment  
Mary Core, Executive Director

Northern Alaska Environmental Center  
Brian Allen, Executive Director

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Alaska Oil and Gas Association  
William H. Hopkins, Executive  
Director

SOHIO Alaska Petroleum Company  
Roger C. Herrera, Alaska  
Exploration Operations Manager

ARCO Alaska, Inc.  
G. T. Wilkinson, Executive Vice  
President

EXXON Company, USA  
E. D. Stout, Manager

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U. S. Department of the Air Force  
Robert L. Klingensmith, Col, USAF  
Chief, Environmental Division,  
Directorate of Engr. & Svcs.

U. S. Department of the Army  
Alaska District, Corps of Engineers  
Harlan E. Moore, Chief  
Engineering Division

U. S. Department of the Interior  
Bureau of Indian Affairs  
Juneau Area Staff  
L. Bruce Bowler

U. S. Department of the Interior  
Fish and Wildlife Service  
Keith M. Schreiner, Regional  
Director

U. S. Department of the Interior  
Geological Survey  
James F. Devine, Assistant Director  
for Engineering Geology

U. S. Environmental Protection Agency  
Region X  
John R. Spencer, Regional  
Administrator

U. S. Department of the Interior  
Bureau of Mines  
John J. Mulligan, Chief, Alaska  
Operations Center

U. S. Nuclear Regulatory Commission

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NOTE

Treatment of Comments Received in an Untimely Manner

As stated in the Draft EIS, written comments were to be accepted until December 10, 1982. This period was subsequently extended to December 23, 1982 in response to a formal written request of the U.S. Environmental Protection Agency (EPA). EPA's comments were subsequently received on December 20, 1982.

On January 5, 1983, the BLM received a comment letter dated December 28, 1982 from:

State of Alaska  
Department of Natural Resources  
Ty L. Dilliplane, State Historic  
Preservation Officer

On January 17, 1983, the BLM received a comment letter dated January 6, 1983 from:

State of Alaska  
Division of Governmental Coordination  
Office of Management and Budget

Both of these letters were received after the comment period had closed and too late to permit specific responses. However, because BLM values the opinions of the State of Alaska and had solicited formal comments from the State, these two letters are printed in the Appendix without specific responses in order to complete the Draft EIS public record. Both of these letters will be given specific consideration in the BLM State Director for Alaska decision process to select an NPR-A leasing program following release of this Final EIS.

The BLM is confident that this Final EIS and its Preferred Alternative reflect State comments supplied informally during the close coordination of the Draft EIS review process.

#### C. Continuing Coordination

During the NPR-A 105(c) Land Use Study process (designated under P.L. 94-258) completed in 1979, the BLM established a program of public and agency involvement in the NPR-A decisionmaking process that has continued throughout this EIS. The BLM has made continuing coordination a specific part of the Preferred Alternative. The BLM intends to seek out the assistance of other regulatory agencies and the public whenever it can to aid in making better management decisions for the NPR-A. The BLM is especially interested in maintaining the formal and informal lines of communication it has established with other Federal agencies, the State of Alaska, environmental groups and, most importantly, the North Slope Borough.

#### IV. FINAL EIS PREPARERS

The team who prepared this Final EIS and their specialties and the chapter(s) to which they contributed are shown in Table 26.

T A B L E 26  
Final EIS Preparers

<u>Personnel Contributing</u>	<u>Position</u>	<u>Participation by Chapter</u>					
		I	II	III	IV	V	VI
Jerry C. Wickstrom	Program Manager, NPR-A	X			X	X	X
Horace Sanders	Assistant Program Manager, NPR-A	X				X	X
Keith Bennett	Regional Economist/EIS Team Leader	X	X	X	X	X	X
James K. Gilliam	Wildlife Biologist Research and Workshop Coordinator	X	X	X	X	X	X
Stan Shepard	Mining Engineer						X
Lou Carufel	Aquatic Biologist						X
Dr. Robert E. King	Anthropologist		X	X	X	X	
Robert Gal	Archaeologist		X	X	X		
Linda Thurston	Technical Editor	X	X	X	X	X	X

Illustrations

James Mroczek

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Mary Burns



## LITERATURE CITED

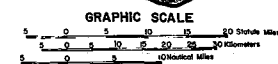
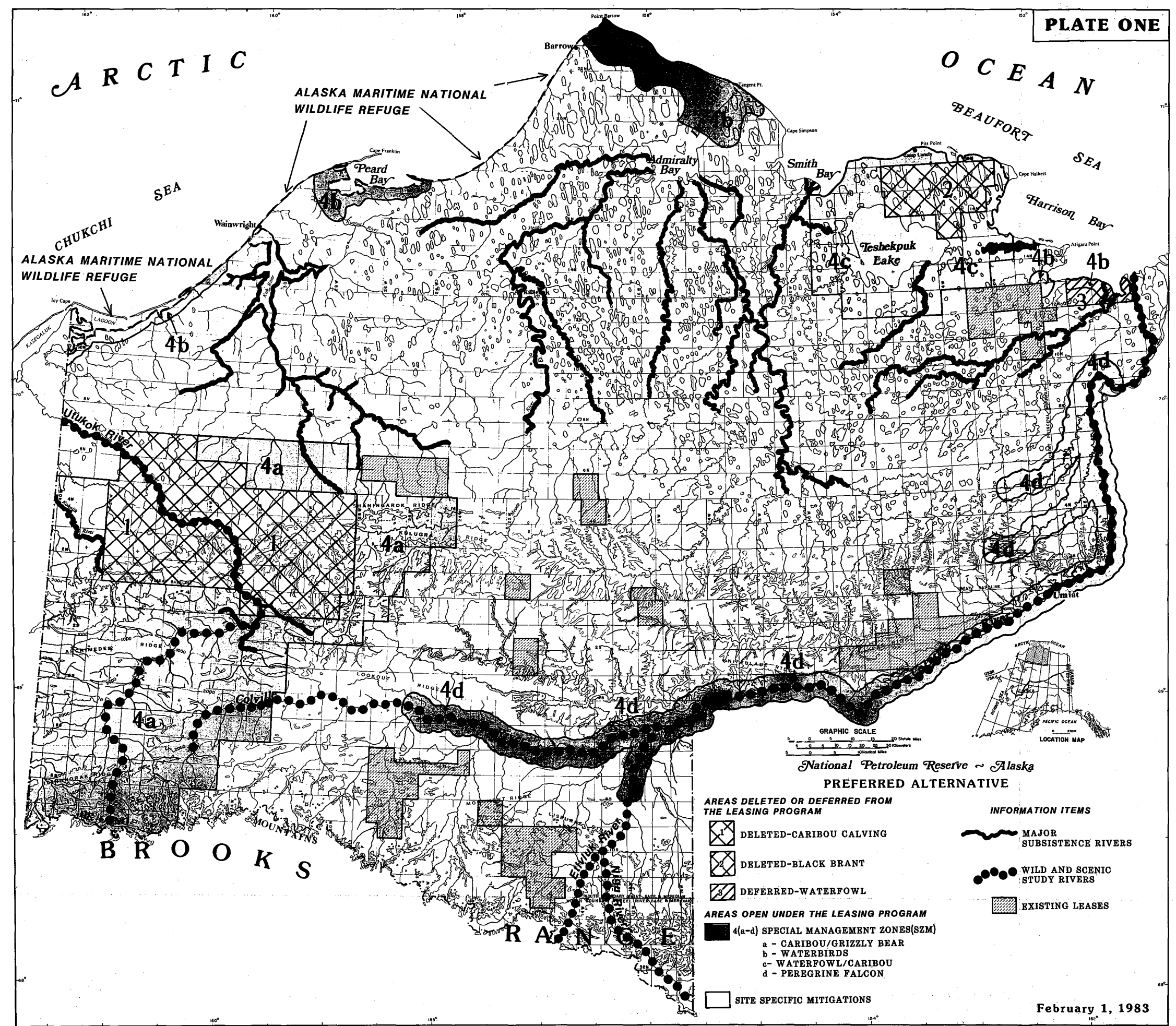
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National Petroleum Reserve - Alaska  
PREFERRED ALTERNATIVE

AREAS DELETED OR DEFERRED FROM THE LEASING PROGRAM

- 1 DELETED-CARIBOU CALVING
- 2 DELETED-BLACK BRANT
- 3 DEFERRED-WATERFOWL

AREAS OPEN UNDER THE LEASING PROGRAM

- 4(a-d) SPECIAL MANAGEMENT ZONES(SZM)
  - a - CARIBOU/GRIZZLY BEAR
  - b - WATERBIRDS
  - c - WATERFOWL/CARIBOU
  - d - PEREGRINE FALCON
- SITE SPECIFIC MITIGATIONS

INFORMATION ITEMS

- MAJOR SUBSISTENCE RIVERS
- WILD AND SCENIC STUDY RIVERS
- EXISTING LEASES

**APPENDIX ONE**  
**CONTENT ANALYSIS OF COMMENTS ON THE DEIS**

## PREFACE

This Appendix is divided into three sections:

Section I contains a summary of the issues discussed in the public meetings following release of the Draft EIS. All of these issues were considered in the preparation of the Final EIS.

Section II contains all public, petroleum industry and government agency comments that were received in a timely manner within the Draft EIS comment period. The BLM has appropriately revised the Final EIS and furnished specific responses to these comments.

Section III contains two comments from the State of Alaska that were not received in a timely manner. These state comments are included to complete the comment record available to the reader. Even though no specific response could be made to comments received in an untimely manner, the Final EIS is responsive to these comments. As noted in Chapter Six, the State of Alaska did furnish informal comments on the Draft EIS. The close BLM/State coordination process accomplished throughout the EIS effort allowed the EIS preparers to modify the Final EIS in response to State concerns even though the State's comments were not timely filed.

SECTION ONE - PUBLIC MEETINGS

## Public Meetings

### I. INTRODUCTION

Meetings with residents of the North Slope were held in Barrow, Atkasuk, Wainwright, Nuiqsut, and Anaktuvuk Pass. At each meeting problems resulting from oil and gas exploration were aired and strong emphasis was placed on the importance of hunting, fishing and gathering both as a means of subsistence and as a symbol of cultural identity. Details differed from village to village but there were common themes sounded in their statements. For this reason, village testimony is presented as a series of themes in the discussion that follows. Meetings held in Fairbanks and Anchorage are summarized in the same way.

#### Nuiqsut Meeting

Four themes emerged in the Nuiqsut meeting: the Federal government is allowing the Siksrik well to be located too near Fish Creek; the inadequacy of knowledge among government biologists about the historical movements of caribou; the need for a broader zone protecting Fish Creek; and the use of explosives in geophysical exploration.

Nuiqsut's concern about the Siksrik well is based on the Federal government's decision to allow the proposed drilling with an oxbow of Fish Creek. According to the testimony, Fish Creek is a central subsistence resource harvesting area for whitefish and caribou. In the past, the people of Nuiqsut have insisted that any lease along Fish Creek contain a stipulation protecting subsistence activities along the creek. In response, the BLM developed a stipulation that requires industrial activities to be kept at least 200 meters away from Fish Creek. In fact, the oil company's proposed Siksrik well was more than 200 meters from Fish Creek. However, because the well is in an oxbow in the creek, the people say that it could seriously affect subsistence use.

Nuiqsut people said that the government should judge proposed industrial activities based on whether the purpose of the stipulation, protection of subsistence, has been met. In the people's view, the Federal government failed to do this by basing the permitting decision about compliance solely on the distance of the well from the creek rather than on a broader view of the effects of the well on their activities.

A charge also was leveled that government biologists lack knowledge of caribou movements in the area. This is based on biologists' statements that the reaction of the Central Arctic and Porcupine Herds to the Trans Alaska Pipeline (TAPS) was not a good "test" of the reaction of NPR-A caribou to a Trans Reserve Pipeline System (TRPS). The biologists also have said that the Central Arctic and Porcupine Herds make major movements parallel to TAPS, and thus TAPS is not a barrier to these herds. Since TAPS is not a barrier to these herds, there is, in the biologists' view no reliable data on the "effects" of a pipeline on major movements of caribou. The people of Nuiqsut dispute this, saying that the Porcupine and Central Arctic Herds historically have moved from east to west and back again. The people say that TAPS altered those movements so that these herds no longer come near their village. The people believe that the government will not allow the Natives' superior

knowledge to play a role in the decisionmaking process. Based on this, the people of Nuiqsut conclude that a three-mile buffer zone around Fish Creek was warranted.

The fourth theme is a claim that the Federal government authorizes the use of explosives. The government responded that it no longer authorizes use of explosives and only allows the use of "vibroiseis"; a technique which propagates shock waves mechanically.

#### Anaktuvuk Pass Meeting

Anaktuvuk Pass people do not want pipelines and roads to block their access to the Central Arctic Herd, which they hunt at the southern limits of its range. People are especially concerned that roads constructed if development takes place may stop the caribou from migrating near their village. They say that construction related traffic while TAPS was being built altered the caribou distribution patterns away from their village. Consequently, they think that similar redistribution of caribou would occur if there is development on the NPR-A.

#### Atqasuk Meeting

The people of Atqasuk expressed five major themes. These included a sense of powerlessness in the face of development, a fear of environmental harm, intrusion of outsiders into their harvesting areas, concern for caribou movements and a desire for improvements in their material well-being.

The people feel powerless for two reasons. They feel that recommendations they repeatedly have made at "informational meetings" on oil and gas development have consistently been ignored. Secondly they recognize that authority over their environment has passed into the hands of outsiders who have development "rights" not subject to meaningful influence by the Inupiat who may suffer from development.

This fear of environmental harm carries two elements: a need to know what kinds of harm might happen and a need to know what the oil company would have to do to rectify the harm.

The concern for caribou expressed itself as a desire to know generally how caribou have altered their movements in response to oil development and how the people of Nuiqsut specifically have been affected by altered caribou distribution. The concern for caribou also was expressed by a question about how road construction might be authorized and what restrictions might be placed on road construction and use. Atqasuk people do not want NPR-A roads to be open to the high volume of traffic that occurs on the road to Prudhoe Bay.

Finally, the people of Atqasuk are aware that economic modernization in such forms as education, medical care, cash employment, Borough tax revenues, transfer payments and oil development have made life better for them. As one elder stated:

"I like the way of life oil heat has brought so that life is better now for the people. It was very hard when I grew up and I am not against development if does not harm the animals."

## Barrow Meeting

The three major themes of the Barrow meeting were: a concern that subsistence resources be protected and access to those resources assured; a need for close Federal and Borough coordination on developments near Native lands and future monitoring of effects of development; and procedural concerns about the EIS.

### Concern For Subsistence

The people of Barrow said that simultaneous development of several leases throughout the Reserve could adversely affect caribou movement; that lakes serving as subsistence fisheries have and will continue to be adversely affected; and that the environmental effects of geophysical exploration using mechanical propagation of shock waves (vibroseising) is not understood. Development should guarantee free movement of caribou and continued access of subsistence harvesters to the Reserve's harvestable resources.

### Close Coordination

This concern was expressed in several ways. First, the Borough as a watchdog over developments will assure that the Federal government weighs the legal rights of subsistence harvesters against the development rights of the Lessee. In the Borough's view, this means that the Lessee only has a conditional (not an absolute) right to develop. Second, the EIS needs to "show" what studies are planned and carry "a commitment" to complete them. Finally, the Federal government and the Borough should work together to protect the rights of Native allottees and others with prior rights.

### EIS Procedural Questions

The commentators felt that the EIS should have a village impact analysis so that people could "see" how they would be directly affected. They also believed that fisheries merited greater consideration in the EIS. Further, it was crucial (in their view) that a meeting be held in Anaktuvuk Pass since that village is the one most likely to be impacted.

## Wainwright Meeting

The five major themes addressed by the people of Wainwright are: ability of the Borough and the village to require oil companies to avoid harming the environment; effects of oil activities on caribou; oil activity impacts on fisheries; concerns for oil development impacts on wolverine; and procedural concerns.

### Ability of the Village to Control Impacts

The villagers want their requests for companies to take certain precautions to be enforced. They also wanted the Borough's comprehensive plan recommendations followed, especially those recommendations to protect Native allotments, fishing camps and cultural sites.



### Oil Activity and Caribou

The villagers wanted to be sure that the BLM knows where caribou calving occurred and that calving areas would be protected. The villagers mentioned the fact that many "deer" on the Reserve were feral reindeer and not caribou and belonged to the Natives (reindeer had been herded by the Natives). The people also expressed concern that caribou might not cross pipelines and asked if the pipelines could be buried.

### Oil Activities and Fisheries

The people mentioned the devastating effects that use of explosives for seismic work has on fish, especially near spawning areas. A number of different fish were mentioned that the people believed have decreased in abundance because of seismic testing.

### Wolverine and Oil Development

The people occasionally find wolverine, usually in autumn, and they are afraid that oil activities may make it even harder to find the reclusive wolverine.

### Procedural Concerns

The people want to know specific information on the leasing program, such as the number of years, size of sales, etc. They want to know where future geophysical activities will take place and which companies will be doing seismic testing.

### Fairbanks Meeting

Two members of the public were present for the meeting which was held at the public library. Questions and discussion centered on concern for management of the Colville River and the concept of Special Management Zones.

### Anchorage Meeting

Comments received at the Anchorage meeting were all individual concerns. One person felt that BLM overstated a concern for caribou since the Trans Alaska Pipeline studies show that the caribou problem has been resolved. He also felt that because "the majority of oil activities take place in the winter," there would be little significant impact.

Another commentor said that there should be an EIS for each lease sale and that anything less would not comply with NEPA standards. A second concern was that BLM had not addressed the cumulative oil and gas impacts for the total Arctic Region. A third person wanted to know how BLM could justify deleting or deferring three million acres from leasing in the southwestern NPR-A, which, in the questioner's opinion, is an area that has the largest potential oil field.

There was no single main theme of concern in the Anchorage meeting.

**SECTION TWO - WRITTEN COMMENTS TIMELY RECEIVED**

**NORTH SLOPE BOROUGH**

**OFFICE OF THE MAYOR**

P.O. Box 68  
Barrow, Alaska 99723  
Phone: 907-852-2611

Eugene Brower, Mayor



December 8, 1982

Jerry C. Wickstom  
NPRA Program Manager  
BLM/NPRA (916)  
701 C Street, Box 13  
Anchorage, Alaska 99513

Dear Mr. Wickstom:

Enclosed are my comments on behalf of the North Slope Borough regarding the Draft Environmental Impact Statement on Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska.

As you can see most of the comments are very specific and are referenced to specific pages within the document. The major points are again noted in the summary. From examining the comments you will note that we are especially concerned as to the effects that exploration and development may have upon caribou and fish resources.

I hope that you will give careful thought to our comments as you and your associates finalize the EIS.

Sincerely,

*Eugene Brower*  
Eugene Brower, Mayor

cc: Bud Stevens, Planning  
Lester Suvlu, EPO  
Files (2)

Enclosure: (1)

Comments On  
Draft Environmental Impact Statement On Oil And  
Gas Leasing And Development In the National  
Petroleum Reserve in Alaska\*

By  
Eugene Brower, Mayor  
North Slope Borough  
Box 69  
Barrow, Alaska 99723  
(December 9, 1982)

Response to North Slope Borough's Comments

Cover: Why is the word development in the title of the DEIS? Does its use here imply that there will be no EIS associated with development? We feel that development must be accompanied by one or more Environmental Impact Statements.

Page 1, para 2: It is here stated that BLM's objective is for this DEIS to be the only one for leasing in NPRA. We feel that it is unrealistic to have one DEIS deal with such a large area for all future leasing. Support for our feeling can be found in your document TE-1 (page 15, para 2) where are sighted a "paucity of information on the lightly explored North Slope" and "this information void makes it difficult for the reader to gain a feeling for the possible cumulative impacts of concurrent development" and "the reader should view our forecast cautiously." Statements such as these seem warranted and thereby serve to underscore the lack of knowledge that exists regarding the distribution of NPRA petroleum resources and the cumulative impacts that may occur.

Additional support is noted on page 13 of the DEIS where the document notes that NPRA is a "mosaic of environments" (item A) and that "no one knows where the areas to be affected or created are" (item B).

In view of the above we feel that this should not be the only EIS relating to leasing. Each lease sale should be analyzed independently to determine if it constitutes a major federal action requiring an EIS. In addition the environmental assessment requirements of the National Environmental Policy Act (NEPA) must not be ignored.

In this same paragraph on page 1 reference is made to impact analysis of field development, pipelines and roads. We feel that these will be major actions and will thereby require one or more EIS.

\*In order to best utilize these comments, a copy of the DEIS should be at hand.

1.

2.

3.

1. The title of the Final EIS has been changed. Every NPR-A development will require specific NEPA compliance.

2. Technical Examinations - 1 (TE-1) (Shepard et al., 1982) explains the necessity for constructing hypothetical models for the EIS.

The Council on Environmental Quality (CEQ), the organization charged with implementing the National Environmental Policy Act, has clearly addressed the question you raised. CEQ has stated (10 CFR 1502.4):

Parts of proposals which are related to each other closely enough to be... a single course of action shall be evaluated in a single impact statement.

The BLM is convinced that the objective reality of a leasing program is the oil and gas activities that result from it. This objective reality, exploration for and development of oil fields, would impact wildlife irrespective of whether an EIS preceded each sale. The lease sales are a single course of action leading to possible discovery and development of oil fields. As a single course of action they should be treated in a single impact statement.

3. Please see response #1.

Page 1, para 4: Here reference is made to leasing after the current schedule which is to end in 1987. We feel that any leasing beyond 1987 must be preceded by another DEIS in order to utilize information gained in the interval regarding impacts, subsistence use patterns, and suspected areas of petroleum resource deposition, etc.

Page 5, para 6: Reference is made to studies that provided a data base for decisions on oil and gas development. This seems to imply that the studies program is over. Has the studies program been concluded for NPRA? If it has not, what are the studies (with estimated funding level) that are going on and/or will be conducted over the next two years? We feel it is essential that a well designed studies program continue such as that suggested in your impact analysis workshop of May 11-13, 1982 for caribou (pages II-11 through II-13) and waterfowl (pages III-24 and III-25).

Page 6, para 2: In the last sentence of this paragraph is mentioned "ongoing BLM studies identifying lands for Wilderness status". We would like to know the following: 1) which lands are being considered; 2) what studies have been done, are being done or are planned; 3) when will BLM make its recommendation?

Page 7, paras 1 and 2: Reference is made to the Alaska Maritime National Wildlife Refuge and that a final determination regarding whether NPRA islands, inlets, etc., are to be included has not been made. Please supply us with a map showing NPRA lands (islands, inlets, etc.) that are being considered and also inform us as to the approximate timetable for the decision making process.

Page 9, Table I-3: This table is very important in concept but as presented is somewhat confusing.

The word "resource" here describes caribou, geese, etc., yet on page 8 (line 3) they are referred to as "surface resources" and on page 63 (line 3) as "biological resources." Which is correct? Confusion can be reduced by referring to them in a consistent manner.

We object to having "fish" relegated to "Type Two" status. How can fish receive a 0 for Exposure and Problematic Mitigation in view of section 7 Fisheries, noted on pages 60 and 61? Since major fish populations occur in bodies such as Fish Creek, the Colville River and the Meade River and these are in areas suspected of having petroleum reserves it seems negligent to relegate fish to Type Two status.

Pages 11 and 12, III Overview of Alternative Leasing Strategies: In the first paragraph of this section it is stated that "no surface occupancy" is now a standard practice and will be discussed "below." There is no discussion here of no surface

4. This type of analysis applies to the NEPA compliance documents for NPR-A permitting actions.

5. The Preferred Alternative, p. 126, (Chapter Five) includes a studies program. The BLM would like to cooperate on all future NPR-A studies through coordination of BLM, State of Alaska and North Slope Borough budgets, objectives and personnel. The BLM Fairbanks District Office would continue its present peregrine falcon and caribou studies of the Teshekpuk Lake Herd if funding becomes available.

6. P.L. 96-514 precludes "Wilderness" designations in the NPR-A.

7. Please direct all questions concerning the Alaska Maritime NWR to:

U.S. Fish and Wildlife Service  
1011 E. Tudor Road  
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Plate One, last page, shows the approximate boundaries of this refuge.

8. This section of the Final EIS has been revised in response to your comment.

9. Please refer to Final EIS Chapter Four, Section I. A. 1., p. 83.

occupancy, the only "discussion" says that it will be mentioned in Chapters Three and Four. This section (III) needs to have a clear discussion of the no surface occupancy alternative.

Page 12, B. Deletion: In this section is mentioned that deleted lands may someday be leased but that the public would be "informed" and that a summary of impact discussion from this EIS be provided. We object to this format. If deleted lands are to be later leased a public meeting on the North Slope must be held and the impact discussion not be limited to this EIS.

Page 12, E. Deferral Leasing: It is here mentioned that leases may be rescheduled to "1992 or beyond." With leasing proposed over a long period of time it is essential that there be more than just one leasing DEIS. An EIS is required for major Federal actions. Each lease sale may be a major action. At least an environmental assessment must be done to determine the need for an EIS.

Page 13, item A and B: In these sections it is emphasized that NPRA is a "mosaic of environments: (item A) and that "no one knows where the areas to be affected or created are" (item B). It is reasons such as these that make it unreasonable that there be only one DEIS for NPRA leasing.

In item A it is noted that the document "An Environmental Evaluation of Potential Development on the National Petroleum Reserve in Alaska" is incorporated into the DEIS by reference. If the document is incorporated into the DEIS by reference why was it not supplied along with the DEIS and the other two documents that were incorporated by reference? Since the other two documents (workshop, TE-1) were supplied with the DEIS we feel that this larger document should also have the distributed at the same time. The failure to include this information undermines the stated purpose of BLM to obtain direction from the public.

Page 15, item C: It is mentioned that on page 7 there is discussion concerning classifying species on the basis of sensitivity and exposure. There is little if any discussion on page 7, however there is some on page 8.

In the first paragraph of this section (page 15) additional evidence is presented as to why it is unreasonable to have this DEIS be the only one for all of NPRA leasing. It is here noted that "BLM decided to primarily focus on sensitive species which because of their migration patterns or use of areas of high perceived oil and gas potential would likely be exposed to oil and gas activities." Please note the word "perceived." This DEIS is then based upon impacts that relate to areas of "perceived oil and gas potential." The reader is cautioned that there is a "paucity of information on the lightly explored North Slope" (document TE-1, page 15 para 2) and that "it is almost certain" actual discoveries will be of different sizes and in different areas from those used in the DEIS and

10.

10. The Preferred Alternative, p. 126, in Chapter Five outlines the recommended deleted lands reconsideration process. This will be a public process.

11.

11. The Preferred Alternative, p. 126, in Chapter Five recommends deferral of one area until the July 1987 sale. Requiring separate EISs for each sale rather than one programmatic EIS is redundant and possibly is against NEPA directives that prohibit any attempt to reduce the significance of a proposed action, such as a leasing program, by reducing it to insignificant component parts (individual sales). See response #2.

12.

12. This EIS considers hypothetical models of development in each major ecosystem on NPR-A. NEPA (40 CFR 1502.22) permits incorporation by reference. The Draft EIS states that this reference is available on request.

13.

13. The classification of resources and issues in Chapter One, p. 1, was modified in response to this comment. Implementation of a programmatic EIS requires the use of hypothetical development models. The phrases referenced in your comment are qualifiers for the discussion for readers who are unfamiliar with NPR-A.

related documents. In view of such cautions there seems to be ample reason for not allowing this single DEIS to include all future NPRA leasing.

Page 22, para 4: It is here mentioned that lands within two miles of the Colville, Etivluk, Nigu and Utukok rivers are withdrawn from leasing by the ANILCA so that it can be determined whether they merit permanent designation as wild and scenic. All of these areas do not seem represented on plate 8 (preliminary preferred alternative). Why are these areas not completely noted on plate 8?

Regarding areas within NPRA being considered for "wild and scenic" status we wish to know the following.

1. Which areas (maps, etc.) are being considered?
2. What studies have been done, are being done, or will be done to provide data for the decision?

Pages 27-29, L. Fisheries: The data presented here at least partially document the importance of waters such as the Colville river to fish. Unfortunately Fish Creek is not even mentioned. Since some of the waters of NPRA (particularly the Colville, Meade, Fish Creek, etc.) are of great subsistence importance and could be gravely damaged during exploration and/or development, we feel that fish have been unfairly relegated to a low priority in this DEIS. Fish should clearly be granted "Type One" status as they are at least as important as "geese" and "other raptors."

Page 31, para 4: In describing equipment used in hunting whales, the word "bombs" can be easily misunderstood. To most people the word probably means something dropped from an aircraft in order to destroy buildings, people, etc. The "bomb" that we use is an explosive device fired from a shoulder gun or darting gun while hunting bowhead whales. The word bomb should either be clarified or deleted here.

14.

14. Plate One, last page, and Figure 14, p. 50, show these study rivers. The Department of the Interior published preliminary findings on the relative values of these rivers in 1979 as a part of the 105(c) studies. Congress has until September 1984 to decide if these rivers should become part of the wild and scenic river program. The BLM will keep the NSB informed on future action.

15.

15. The Final EIS considers fisheries to be a high risk resource. Major subsistence rivers have been highlighted on Plate One, last page.

16.

16. The text has been altered to reflect this change.

Pages 31-33, 1. The Mixed Subsistence/Cash Lifestyle: In this section some brief mention is given of the importance of the land, the waters and the living resources to our way of life. You are correct in stating that we fear that resource development will interfere with our "gardens" and our subsistence activities. Since our very Culture is at stake we feel that impacts upon subsistence use animals must be very carefully assessed. We feel that much more study must be devoted to subsistence use animals in NPRA and how they will be impacted by exploration and development. What is the extent of the NPRA studies program that will assess impacts relating to exploration and development? Please inform us as to the scope and funding level of the NPRA studies program as now proposed for this year and the next 2 years.

Pages 34-36, B. Cultural Resources: In the next to last sentence in para 1 of page 36 it is noted that most tracts have not been examined for cultural resources. Will lessees be required to survey their holdings for cultural resources? We feel that they should be so required.

Page 42, para 1: Weren't "type two" resources discussed on pages 8 and 9 as well as brief mention on page 7?

Page 42, para 2: In this section and in other areas of the DEIS, the word illustrative should be replaced by hypothetical to minimize confusion. Hypothetical more clearly shows that the development scenarios may or may not occur at the indicated locations:

In this paragraph the word fully is used twice to describe how the illustrative data were handled. We feel that "fully" is an overstatement.

Page 43, Table III-1: In this table, the column for Fields should be designated Hypothetical Fields so as to better show that these may not be "real."

Page 51, last para: From examining this paragraph it seems that at least six flights would be required per week. It would be very helpful if there was a clear statement as to how many flights would be required per week and specify the aircraft type (C-130, twin otter, etc.) most likely to be involved.

Page 52, C. Cumulative Development: This section on cumulative development is far too brief.

Table III-4 should be clearly identified as "suspected fields." As presented these fields seem to be "fact."

17.

17. The Preferred Alternative, p. 126, in Chapter Five recognizes the importance of conservation of the subsistence lifestyle and addresses a future program of cooperative studies. See response #5. It also recommends the following measures to conserve the subsistence lifestyle:

- a. Deletion of areas in the Utukok Uplands (for caribou calving) and north of Teshekpuk Lake (for goose molting);
- b. Provision for continued subsistence access to development areas;
- c. The company is restricted from surface areas of Native allotments unless the allottee gives permission;
- d. Establishment of a minimum 200-meter set back zone for all rivers with subsistence fisheries (see Plate One, last page, and Figure 20, p. 81).
- e. Requirements for each permit applicant to gather subsistence use data and coordinate closely with local residents to protect traditional land use sites, access and religious sites (see Figure 20, p. 81).
- f. Provision for an environmental training program for all workers, including briefings on avoiding impacts to local subsistence uses (see Figure 20, p. 81).
- g. Establishment of seasonal restrictions to protect caribou calving and migration and waterbird use (see Figure 20, p. 81).
- h. In addition, other stipulations on Figure 20, p. 81, such as Cultural Resources, Habitat Preservation, Pollution/Erosion Control, Existing Uses and others, provide blanket protection to subsistence values.

18.

18. The Lessee/Permittee is required to conduct appropriate cultural resource inventories of a proposed affected area before receiving authorization (see Figure 20, p. 81).

19.

19. The text has been appropriately altered.

20.

20. A brief analysis of concurrent development in the Arctic has been added to Chapter Five, p. 121.



Page 53, Table III-7: It is here presented that 15-20 major oil-spills will occur in association with pipelines. This is alarming to say the least. Such figures make pipeline crossings of rivers to seem even more risky than we had imagined.

Page 54, paras 2-5: In these paragraphs it is noted that oilspills will travel long distances along rivers and streams. We agree with this and feel that any pipeline crossing of a river must be done with the utmost care.

Page 55, item III: The title of this section should specify what "Type Two Values" refer to. We assume that it refers to Type Two resources noted on page 9. This continual alternation of terms (values, resources, surface resources, biological resources) while apparently referring to ducks, caribou etc. is very confusing.

Page 56, item A: In this section all "Type Two" animals except fish and foxes seem to be mentioned. We are especially concerned that fish are omitted here. They should be included.

Pages 58 and 59: Throughout this DEIS the ranking of headings and subheadings is confusing. In order to keep the ranking in focus, one must keep referring to the Table of Contents. In the Table of Contents the ranking of headings and subheadings is clearly presented.

A good example of how confusing the text is in this regard can be seen on pages 58 and 59 under items B and C. Note that under item B, it is fairly clear that items 1-3 are subheadings in that the text of items 1-3 is indented. Compare with items 1-3 of item C. It is also confusing in that items B and C are underlined and the first letter of each word is capitalized which is the same format as for items 1-3 under each.

Page 58, item 1: Who will define "significant" and "vicinity"? How they are defined will determine how effective this stipulation will be.

Page 58, item 2: In line 2 the word "may" should be replaced by "will."

Page 58, item 3: The review process for such "exceptions" should include comment by the North Slope Borough.

In the last sentence on this page "cumulative effects" is briefly mentioned. There should be a specific section in the EIS that deals with cumulative effects.

Page 59, 1. Gravel Stipulation: The last sentence in this paragraph is too weak especially when using terms such as "permanently damage" and "significant areas."

21.

21. The "Oil Spills Risk and Response Analysis" has been rewritten for the Final EIS. The BLM agrees that pipeline river crossings must be constructed with utmost care.

22.

22. The text has been appropriately altered.

23.

23. This entire section of Chapter Three, p. 55, was rewritten in response to this and other comments. The terms "significant" and "vicinity" will be defined by the BLM District Manager following the NEPA compliance procedure that is required for each permitting action. The NSB will be appropriately consulted on any exceptions. A brief analysis of concurrent Arctic development was added to Chapter Five, p. 121.

Page 59, item 3: Inline 7 of this section it is stated that facility siting, etc. "may be restricted" if they are likely to have an adverse effect upon swans etc. If there is likely to be an adverse effect, then the activities must be restricted and not "may be restricted."

Page 60, item 5, line 3: Shouldn't it be "human/wolf" rather than "human/wolverine"?

Pages 60-61, 7. Fisheries: In this section it appears that fish are really going to be impacted and the data presented here do not seem to allow fish to be classified on page 9 as "Type Two" resources.

In the first paragraph on page 61 concerning activities on subsistence use streams, if there are to be any exceptions, the Borough must be involved in the review process.

In the second paragraph on page 61 concerning the "200 meter set back" from certain bodies of water we want that enlarged especially as it relates to Fish Creek and the Colville River. Due to the extreme importance of these streams we want Fish Creek and the Colville River to be protected on each side by a 3 mile buffer zone. Regarding Fish Creek the 3 mile buffer on each side is to exclude all drilling, all use of explosives, roads and pipelines. Regarding the Colville River, the 3 mile buffer on each side is to exclude all drilling. Road and pipeline crossings of the Colville are to be kept to an absolute minimum. We feel that such extensive buffer zones are needed to protect these valuable subsistence use fishery resources.

In the first sentence of the last paragraph of this section is noted that impacts would remain even with the application of the 200 meter "buffer concept." The buffer concept is good but 200 meters is totally inadequate regarding Fish Creek and the Colville River. Also in this last paragraph oil spills (line 9) are noted as resulting in short term local impacts.

Page 62, Soils: This one paragraph (6 lines) section on soil impacts is far too little. Where are references to; road dust on snow, effects of cat trains on tundra, damage to vegetative mat with subsequent permafrost effects, etc.?

Page 62, Water Quality: This one paragraph (9 lines) section on water quality impacts is far too little.

Page 63, I. Impacts to Biological Resources Under Various DEIS Alternatives: The title of this section is misleading (or at least confusing). From reading this section it seem that "Biological Resources" are "Type One" resources as noted on page 9. If this is the case, then this heading should have "Biological Resources" changed to "Type One Resources" or something to that effect. This change should also be made in the Table of Contents.

24. Reponse #17 also applies here. The BLM recognizes the importance of fisheries to the subsistence lifestyle. Special lease stipulations already in use (see Figure 20, p. 81) are recommended for application to major subsistence rivers (see Plate One, last page) and other appropriate areas. The restrictions suggested are inappropriate for widespread use on the public lands. As recommended in the Preferred Alternative (Chapter Five, p. 121), surface occupancy and seasonal restrictions should be used in the permitting process as appropriate.

The 200-meter setback distance is the minimum buffer distance. If a wider setback is required during the permitting process, it will be granted. The Preferred Alternative, p. 126, (Chapter Five) reflects BLM's wish for continuing consultation and coordination with the NSB when many of these permitting issues could be resolved.

The BLM has begun an investigation of the potential effects on fish from geophysical exploration using explosive and Vibroseis systems. This question has been asked many time in public meetings on the North Slope. The BLM Fairbanks District Office provided the following preliminary assessment and will continue their investigations. It is taken from P.R. Johnson's 1977 report entitled "Ground pressure exerted by underground explosions," the U.S. Army Corps of Engineers CRREL Laboratory, Alaska Projects Office, at Fort Wainwright, AK.

Past high explosive charge tests have documented that peak shock pressures of 40-50 psi are usually fatal to adult fish with swim bladders and that pressures as low as 2.7 psi will kill eggs and alevin. Johnson (1977) illustrates that energy from a 100-pound explosive charge is most likely dissipated to less than 2 psi within 200 feet of the source.

The Vibroseis system has for the most part replaced the conventional explosive seismic as the primary upland geophysical instrument in use today. Unlike the single pulse explosive shock of conventional seismic, the Vibroseis functions by the use of continuous low energy 8-75 Hz signals. A person can stand immediately next to the Vibroseis source and hardly be aware of the energy being transmitted. Although we have not been able to find any field test data concerning the effects of Vibroseis on fish, it seems likely that the vehicles carrying the equipment over the frozen surface will have as much effect upon the fish as the source of Vibroseis energy.

We may conclude that there would likely be fish displacement adjacent to the Vibroseis due to noise disturbance, but fatalities will probably not occur.

25. Final EIS Sections III. A. 4., p. 74, and B. 2. e., p. 77, in Chapter Three have been altered as a result of this comment.

26. The text has been appropriately revised.

Page 63, last para: In the last sentence is mentioned that a catastrophic oil spill or tundra fire reaching the Teshekpuk Lake Goose Molting Area "could" result in significant impacts. That doesn't make sense. Such an event would result in significant impacts.

Page 64, para 1: Here it is mentioned that impacts will be eliminated regarding peregrine falcons through use of the one mile buffer at nest sites. If a landing strip is located 1.1 miles from a nest and C-130 aircraft and large helicopters use it, the noise level at 1 mile is substantial, as anyone who lives within a mile or two of the glide path of an airstrip utilized by C-130's can attest. We in Barrow are well aware of the noise of these aircraft. This one mile buffer is inadequate unless there are good data to support it.

Page 64, next to last para: In this brief paragraph (4 lines) it is twice mentioned that "no surface occupancy" is a standard requirement. On page 11 (para 5) it seems that it just recently became "standard" as a result of scoping decision, probably in 1982. Where is there a clear definition of no surface occupancy? There just doesn't seem to be one.

Page 64, last para: In this section on caribou it is mentioned that indiscriminate use of no surface occupancy without "prior studies" would prove detrimental to caribou and petroleum development, but how would it be detrimental to caribou? That seems to be an overstatement. We agree that "proper studies" need to be done, especially long term studies, but we don't see how an effective studies program is possible in view of the statements keeping studies at the level to just support permit related decisions (pages 58-59).

Page 65, Grizzly Bear: In this section is again mentioned the need for a studies program.

Page 65, Peregrine Falcon: In this section and in Plate 9 it is not clear what "nest site" means. Does it mean a nest with birds in it or a nest site that has been used and may again be used but there are not birds in it at the moment? As we mentioned above the one mile buffer seem grossly inadequate, especially regarding large aircraft and helicopters.

Page 65, next to last para: Is this the only thing that no surface occupancy does? If not, the word also should be inserted before prohibiting.

Page 65, last para and page 66, first para: Since it is noted that there is no idea as to the degree to which caribou will habituate to industrial disturbance in NPRA, there should be an extensive long term studies program designed to examine this. Will there be a long term caribou studies program?

27.

27. Peregrine falcons could be adversely affected by airport operations only a mile from a nest site. However, the stipulation in question (see Figure 20, p. 81) establishes a minimum setback distance. If a setback of over one-mile is considered prudent, it will be required.

28.

28. The proper use of surface occupancy restrictions is given in the Final EIS, Chapter Four, Section I. A. 1., p. 83. The Preferred Alternative, p. 126, (Chapter Five) recognizes the need for further cooperative studies along the lines suggested. Studies of grizzly bears would be considered along with other study priorities.

29.

29. In any permitting process, all suitable habitats will be regarded as potential peregrine falcon nest sites to be protected as appropriate. The term "nest site" denotes all known and potential nest sites.

30.

30. Please see response #28.

31.

31. The Preferred Alternative, p. 126, (Chapter Five) addresses future NPR-A studies. The BLM wants to cooperatively plan with other interested parties, especially the NSB and State of Alaska to determine specific study needs and priorities as they relate to agency budgets, personnel and responsibilities. See response # 5.

Page 66, para 3: It is here noted that qualitative predictions are supported by the Caribou Discussion Panel while quantitative impact predictions are by the EIS team. Why wasn't the panel asked to also comment on quantitative impacts?

Pages 66-74, items a-d: The first sentence of each Qualitative Analysis section clearly states that the Caribou Discussion Panel performed the basic analysis. In each Quantitative Analysis section there is no mention that this was not done by the Panel but was done by the EIS team. This is misleading. Many readers probably assume that the Panel did both since they are prominently mentioned in the Qualitative Analysis section. The brief statement clarifying the situation (page 66, para 3) is not adequate.

In these pages there is only brief mention of the effects upon subsistence users. Since the impacts are likely to be great upon people that depend upon the caribou there should be a village by village detailed discussion as to how their caribou hunting is likely to be affected.

Page 77, para 2: This paragraph on seismic exploration and effects upon bears is very misleading. The distances need to be mentioned ("near" is inadequate) and "no bears" needs to be clarified. How many bears were examined?

Pages 65-88: In these sections are the comprehensive analysis of Type One resources. There should be a comprehensive analysis of impacts upon fish.

Pages 83-87, Comprehensive Analysis of Peregrine Falcon: In this section much is said about there being no effects upon the peregrine (page 83, 11th line from bottom; page 84, 5th line from top; page 85, 9th line from top). How can there be no effects when the bird is "protected" by stipulations such as presented on Plate 9 items (a) and (c)? Note that item (c) would allow a permanent airstrip 1.01 miles from a nest site. Do you think that the use of such an airstrip by C-130 aircraft and helicopters would not bother nesting peregrines? If this is your opinion we would like to see data that support it.

Page 89, para 2: It is here stated that little is known of polar bear use of NPR-A. In view of this there should be a long term study program to correct this acknowledged lack of information.

Page 89, para 4: Reference is made to current studies on caribou in the Teshekpuk Lake area. Please inform us as to the types of studies planned, funding level and duration.

Pages 89 and 90, Geese: Reference is made to ecological studies on the Fish Creek-Colville River Deltas. Please inform us as to the types of studies, funding level and duration.

32.

32. The Caribou Discussion Panel (CDP) was asked for quantitative predictions but was unable to make any. Final EIS Chapter Four more clearly separates the findings of the CDP and the EIS team in response to this comment.

33.

33. Final EIS Table 23, p. 120, has been added in response to this comment.

34.

34. Please refer to Reynolds (1979) which was furnished to the NSB science advisor. These are direct quotes from that document which lead to establishment of one-half mile buffer zones in which geophysical operations are prohibited around bear dens (see Figure 20, p. 81).

35.

35. The analysis of the importance of fish to the subsistence lifestyle as a high risk resource is provided in Chapter Four, p. 79.

36.

36. Please refer to response #27. The stipulations in Figure 20, p. 81, establish minimum setback distances that can be increased as required to mitigate the types of impacts identified in your comment.

37.

37. The Preferred Alternative, p. 126, in Chapter Five addresses future NPR-A studies. The BLM hopes to make future NPR-A studies of the type you have identified as a cooperative process involving BLM, NSB and State of Alaska funding and personnel. See response #5.

The 1982 report by P. Reynolds listed in Literature Cited is the most recent BLM report on the Teshekpuk Lake Herd. For reports on the Fish Creek - Colville River Delta contact:

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Page 90, D. Design Solution Alternative: In the next to last sentence of the first paragraph of this section it is stated that "\_\_\_\_\_ impacts from further exploration within NPRA would be insignificant" and that this is a conclusion of the Caribou Discussion Panel. This really seems to overstate what the Panel says on page II-3 of the analysis workshop proceedings. The Panel notes (page II-3, para 3) that impacts are unlikely "assuming comparable levels of activities and adequately enforced stipulations." Is there any assurance that the level of exploration activities will not increase? Also note that the Panel (page II-3, para 4) states that the "Teshekpuk Lake area is clearly the area of greatest concern with regard to potential impacts of winter seismic operations."

Page 91, item b: The North Slope Borough should be included in this consultation process. Item b as stated is difficult to understand. What is meant by "regional wildlife ecology and sensitivities?"

Page 91, 2. Processing Procedures: The three paragraphs of this section are very important to us. It is here mentioned that materials submitted by the lessee will be examined for "accuracy and adequacy" and that there must be "adequate written evaluation" regarding permit exceptions and that there will be a determination made as to whether there will be a determination made as to whether there will be "an adverse effect on these key species."

In regards to this important matter we agree with the Waterfowl Discussion Panel (pages III-21 and III-22, items (A-C) in citing the need for review of the data in addition to review by BLM and MMS. We feel that a sound review process must be established that would at least also include the North Slope Borough and the Caribou Discussion Panel and the Waterfowl Discussion Panel.

Page 92, Para 1: In order for this statement on design solution to be correct regarding caribou "freedom of passage" there must be a long term caribou studies program in place. Does BLM plan to have such a program?

Page 93, Peregrine Falcon: In this DEIS there is the over and over again statement that no permitted activity will be allowed to impact peregrine falcons. We again ask how this can be so if permanent airstrips are allowed within 1.1 miles of nest sites?

Page 94, Caribou: In the last sentence of this section it is noted that caribou use patterns for particular development sites are not yet known, this is good justification for long term caribou studies. What is the nature of BLM's proposed long term caribou studies for NPRA?

38.

39.

40.

41.

42.

43.

38. These EIS analyses and panel statements have consistently indicated that likely exploration activity levels for NPR-A would be at or below the levels of Federal activity in recent years. The BLM is aware that exploration may have to be conducted under more site-specific stipulations in some parts of the Reserve to ensure that impacts remain insignificant.

39. The Preferred Alternative, p. 126, (Chapter Five) addresses intended consultation and coordination. The advice of the NSB has been and will continue to be of great assistance. "Regional wildlife ecology and sensitivities" has been more better defined in the Final EIS.

40. The Preferred Alternative, p. 126, in Chapter Five recognizes the need for a close BLM/NSB working relationship. The BLM would welcome the technical assistance of the NSB as envisioned by the cooperation and consultation process. However, it would be impractical, procedurally difficult and inefficient to reconvene the workshop panels to consider every permitting action. Since the publication of the Draft EIS, some of the Minerals Management Service's functions, including management of the NPR-A, have been incorporated into the BLM. The close working relationship established with the NSB and other agencies throughout this EIS process will greatly assist the BLM in adequately performing these increased responsibilities.

41. Please refer to response #31.

42. Please refer to responses #27 and #31.

43. Please refer to response #31.

Page 94, Grizzly Bear and Polar Bear: In both of these sections the need for more data regarding distribution is cited. Is BLM going to gather such data?

Pages 96-99, III. Socio-Cultural Change: This section is totally inadequate. This section needs to include much more detail. At the very least there must be a village discussion of how subsistence resources will be impacted. People in Nuiqsut and Anaktuvuk Pass in particular have a right to see it clearly written how their subsistence resources will be impacted.

Page 100, last para: When will the "analysis of the need for withdrawal" be completed? Who will do the analysis? Who will review their findings?

Page 102, para 1: We agree that a public process should be utilized to determine when such lands should be leased and that no rights of way be granted.

Page 102, para 3: This statement must be strengthened. The word "could" (in first line) should be replaced by "will".

Pages 100-102, III. Preliminary Identification of a Preferred Alternative: Plate 8 apparently summarizes the BLM preferred alternative.

We feel that Plate Eight is a good start but should at least have the following additions.

1. The areas recommended by the Caribou Discussion Panel should be included as mentioned in Figure 1 of the Impact Analysis Workshop proceedings.
2. The areas recommended by the Waterfowl Discussion Panel should be included as mentioned in Figure 2 of the Impact Analysis Workshop proceedings.
3. Where there is overlap between Figure 1, Figure 2 and Plate 8, the more protective recommendations is to apply.
4. Fish Creek is to be protected by a 3 mile buffer zone on each side which is to exclude all drilling, all use of explosives and all roads and pipelines.
5. The Colville River is to be protected by a 3 mile buffer zone on each side which is to exclude all drilling. Road and pipeline crossings are to be kept to an absolute minimum.

44.

44. Please refer to responses #28 and 37.

45.

45. Final EIS Table 23, p. 120, responds to this comment.

46.

46. Please refer to the Preferred Alternative, p. 126, (Chapter Five) treatment of deleted areas. No recommendation for Congressional withdrawal will be made by BLM in this EIS process.

47.

47. The Final EIS Preferred Alternative, p. 126, (Chapter Five) recommends a public process for review of deleted lands for possible leasing. However, rights-of-way may be granted subject to the findings of a specific NEPA compliance document.

48.

48. The text has been appropriately revised.

49.

49. Plate One, last page, and Chapter Five, p. 121, present the Final EIS Preferred Alternative, p. 126, which specifically address your comments and are in keeping with P.L. 96-514 directives and multiple use management objectives. Plate One, last page, reflects the workshop recommendations (Gilliam and Lent, 1982), although not identical. Three-mile buffer zones on Fish Creek and the Colville River appear to be unwarranted as addressed in response #24.

Plate 7, Caribou: In the "Deletion" section (line 3) reference is made to "the habitats." This is confusing as it seems to only refer to calving areas. If that is so then the statement should be replaced.

In the "Design Solutions" (lines 15-16) it is stated that "costly redesign" of facilities may be required. There seems to be no mention of this in the text such as pages 90-91 where it seems that the concept should be mentioned.

Plate 7, Geese: In the "deletion" section (lines 8-11) is stated that deletion would insure that the loss of individuals would not become measurable in populations. This is a very presumptive statement. Is there going to be a study program designed to verify this statement?

In the "Deferral" section the exact same statement is made. Our comments are the same.

Plate 7, Peregrine: Here again is stated that recreationists but not industrial activities will impact the peregrine. We again ask, do you really think that a permanent airstrip 1.1 miles from nest sites will result in no impact?

Plate 7, Polar Bear: In the "Design Solutions" section is noted that a study of the accuracy of the conclusions presented will be done. The Borough would like to know the nature of such studies and their proposed time course. The last sentence in the section is confusing. What is meant by "\_\_\_no permitted activity ever adds to possible cumulative significance"?

Plate 9: In the "Peregrine Falcon" section we feel that the one mile buffer from nest sites is inadequate as mentioned several times in our comments.

In the "Subsistence Fisheries" section we feel that Fish Creek and the Colville River should have a 3 mile buffer zone on each side as noted earlier in comments pertaining to pages 100-102.

50.

50. Draft EIS Plate Seven was dropped because it was confusing. Your specific comments are now addressed in Chapters One, p. 1, Four, p. 79, and Five, p. 121, of the Final EIS.

51.

51. Draft EIS Plate Nine has been included in Final EIS Figure 20, p. 81. The one-mile buffer zone for peregrine falcon and 200-meter subsistence fishery buffer zone remain effective as minimum setbacks.

## Summary

1. This must not be the only EIS pertaining to NPRA leasing. Each lease sale must be analyzed independently under the requirement of NEPA and other appropriate legislation.
2. We object to fish being relegated to "Type Two status" (page 9, Table I-3). In view of the likely impacts to fishery areas and in view of the importance of fish as a subsistence use animal, we feel that fish be considered "Type One" animals.
3. There should be a clearly defined section in the EIS that deals with cumulative impacts. In barely received lip service in the present document.
4. There must be a well designed, well funded, long term studies program that accompanies leasing and development in NPRA. The studies program should include the following:
  - a. Long term studies designed to detect adverse environmental impacts associated with exploration and development.
  - b. The studies proposed by the Caribou Discussion Panel on pages II-11 through II-13 of the Impact Analysis Workshop proceedings (October, 1982).
  - c. The studies proposed by the Waterfowl Discussion Panel on pages III-24 and III-25 of the Impact Analysis Workshop proceedings (October, 1982).
5. There must be a satisfactory method for review of appropriate materials (particularly study results) submitted by lessees/applicants. This section in the DEIS is treated on page 91, item 2. In this matter we agree with the recommendations made by the Waterfowl Discussion Panel (pages III-21 and III-22, items A-C) in the Impact Analysis Workshop proceedings (October, 1982).
6. There must be an adequate treatment in the EIS, on a village by village basis, of impacts on subsistence resources. The Socio-Cultural Change section (pages 96-99) in the DEIS is totally inadequate.
7. The Preferred Alternative as presented in Plate 8 is a good starting point but should at least have the following addition.
  - a. The areas recommended by the Caribou Discussion Panel should be included as mentioned in Figure 1 of the Impact Analysis Workshop proceedings.
52. Under the requirements of NEPA and P.L. 96-514, one programmatic EIS, rather than several EISs for individual sales, best serve the total public interest. Further NEPA compliance will be required for each permitting process. Please see response #2.
53. Please see response #17.
54. Chapter Five, p. 121, includes a model of possible effects of concurrent Arctic development.
55. The BLM intends to pursue a program of well-designed cooperative studies commensurate with likely risks with the State of Alaska and the NSB to share funds, objectives and personnel.
56. The BLM intends to continue the cooperation and consultation with the NSB developed in this EIS process into leasing decisions and the permitting stages of NPR-A projects. The BLM also is committed to basing its decisions on the best scientific information available as suggested by the Waterbird Discussion Panel.
57. The Final EIS Table 23, p. 120, responds to this comment.
58. Please refer to response #49.



- b. The areas recommended by the Waterfowl Discussion Panel should be included as mentioned in Figure 2 of the Impact Analysis Workshop Proceedings.
  - c. Where there is overlap between Figure 1, Figure 2 and Plate 8, the more protective recommendation is to apply.
  - d. Fish Creek is to be protected by a 3 mile buffer zone on each side which is to exclude all drilling, all use of explosives and all roads and pipelines.
  - e. The Colville River is to be protected by a 3 mile buffer zone on each side which is to exclude all drilling. Road and pipeline crossings are to be kept to an absolute minimum.
8. Certain activities such as caribou hunting, waterfowl hunting and fur trapping require use of extensive areas around the villages. The pursuits are easily disturbed or disrupted by industrial and commercial activity such as overflights, road construction and use, and industrial noise. Impacts of this nature could be mitigated by thorough design solution treatment for the affected lands and an adequate knowledge of the annual subsistence cycles of each village in NPR-A. At a minimum the following three areas need consideration:
- a. The village of Nuiqsut should have a Design solution zone which encompasses a 30 mile radius of the village and BLM discussion tracts 251, 273, 296, 318, 345, 212. These are important caribou, water bird, and fur bearer areas used by the village that are not protected in the proposed preferred alternative.
  - b. The Kuk river drainage encompasses much of the important subsistence lands used by the people of Wainwright. Further studies must be conducted to determine the temporal and spacial use of these lands.
  - c. The lands south of Barrow to Atkasuk in addition to a 30 mile radius around Atkasuk receive heavy use for caribou hunting, fishing, trapping and goose hunting. These areas, plus BLM discussion tracts #1-60, are unique because they are near a high population center and have numerous Native allotments and cabins through them.
9. In the central region of NPR-A, four major drainages are used for subsistence purposes. The numerous feeder streams and lakes associates with these drainages are also used for subsistence purposes. The Inaru, Ikpikuk, Neade and Topagaruk rivers are considered vital, and the utmost care must be used in regulating industrial activities along them. This regulation must be reflected in a minimum of a 1500 meter Limited Surface Occupancy zone along these rivers. There is also concern that

59.

59. The BLM recognizes the importance of subsistence use of NPR-A and has gone to great lengths to conserve these uses (see response #17). The Preferred Alternative, p. 126, (Chapter Five) and special lease stipulations (Figure 20, p. 81) seek to conserve subsistence resources throughout the NPR-A. The BLM believes the impacts you mention can be adequately minimized to ensure continuation of subsistence uses. The design solution concept is applicable to all permitting processes on the NPR-A including those adjacent to Nuiqsut. All NPR-A wildlife species are legitimate conservation concerns under multiple use management, and potential impacts will be minimized. The BLM agrees that the Kuk River and lands south of Barrow to Atkasuk should have a high priority for future studies if funds are available.

60.

60. Final EIS Plate One identifies the major subsistence rivers of NPR-A as a start in the identification of all subsistence use sites. The BLM intends to work closely with the NSB and Permittees to assure that all potentially affected sites are identified and impacts minimized. The BLM feels that the 200-meter minimum setback requirement for subsistence rivers is adequate; however, if the specific activity or proposal in a permitting process warrants greater setbacks, they will be required.

the bodies drain into these rivers must be adequately protected so as to prevent contaminants from entering major drainages via rivulets. It must be reiterated that the Admiralty drainage supports a major portion of the subsistence activities in NPRA. Finally, the ecological integrity of Admiralty Bay must be protected so as to not impede anadromous fish movement and productivity.



y Wilbur Molls in Alaska, The Great Land

Received 12/14/82  
NPR-A 1982  
**SIERRA CLUB**

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December 10, 1982

Bureau of Land Management  
ATTN: Jerry C. Wickstrom  
NPR-A Program Manager  
Alaska State Office  
701 C Street, Box 13  
Anchorage, AK 99513

RE: Oil and Gas Leasing in National Petroleum Reserve-Alaska

Dear Mr. Wickstrom:

The Sierra Club is pleased to offer our comments on the Draft Environmental Impact Statement (DEIS) on oil and gas leasing and development in National Petroleum Reserve-Alaska (NPR-A). While the desire to compile all the information for future leasing into one DEIS is commendable, the effort falls far short. We request that the Bureau of Land Management (BLM) rewrite the DEIS to include a time frame (one year, five years, thirty years, and so on) and proposed schedule for leasing including location of sales and when each area may be sold. The impact of any action in NPR-A is as much a function of timing and location as how the action is undertaken. Without a schedule of timing and location of sales, the DEIS fails to provide the public with sufficient information on oil and gas leasing in NPR-A. How can the public comment on adequate mitigation without knowing when and/or where a lease sale will occur?

Since no clear rationale is given, it is not clear how BLM justifies this document as the only DEIS to be prepared for leasing in NPR-A. As the DEIS states, NPR-A is a diverse ecosystem with unique and valuable scenic, fish and wildlife values, including endangered species (plant and raptor). Because these resources are outstanding, we recommend preparation of an EIS for each lease sale. As conditions change and experience is gained in operating in NPR-A, this knowledge must be made available for public review and comment. Further, the DEIS acknowledges that lease sales and oil and gas discoveries in certain areas pose more of an environmental threat than in other areas. For example, developing roads and pipelines in interior, remote areas will affect caribou and other wildlife migration patterns. Since this is not discussed in detail in the present DEIS, it will have to be addressed in future EIS's.

Response to Sierra Club's Comments

1. The Final EIS Preferred Alternative, p. 126, in Chapter Five and Plate One, last page, provides more specific information for the recommended approach.

The BLM believes this Final EIS provides the necessary NEPA compliance prior to implementation of a leasing program because as stated in the Preferred Alternative, p. 126, in Chapter Five each permitting action will require further NEPA compliance. However, any program requiring a separate EIS for each sale could be interpreted as trying to reduce a NEPA significant action, implement a leasing program into insignificant component parts, individual lease sales. Therefore, the BLM does not feel a series of redundant EISs for each sale complies with either NEPA or the total public interest especially when considering the further permitting process/NEPA compliance procedures recommended in Preferred Alternative, p. 126.

Mr. Jerry Wickstrom  
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Page Two

The requirements of leasing in the Colville River corridor are not succinctly summarized and rely on short-term solutions. For example, the wild and scenic river withdrawal will expire in September 1984. If Congress doesn't designate the river as part of the Wild and Scenic Rivers System, how will that affect oil and gas leasing activity along the Colville River? If it does, how will that affect oil and gas leasing activity? The DEIS should make recommendations for protection of raptors in the Colville River corridor beyond 1984.

The lease stipulations listed in Plate 9 for raptors are inadequate. The known nest sites of peregrine falcons are carefully protected, but what of new nests, abandoned nests, cliff habitats, and other raptors? How will these be protected?

What is the "Raptor Nesting Site Special Management Zone" identified Plate 8? There is no discussion of what this designation means. Is it a formal administrative designation? How does it fit with the study river status of the Colville? What are the protective provisions of a special management zone? How long will this designation last? A "raptor nesting zone" implies protection for all raptors, not just peregrines, yet the stipulations offer specific protection for peregrines only. While there will certainly be beneficial effects for other raptors in the vicinity of peregrines, what about raptors that don't nest within the vicinity? The Sierra Club recommends the Colville River be deleted from oil and gas leasing and consideration be given to establishing a "Bird of Prey Area."

The withdrawal of a portion of the Teshekpuk Special Area and some of the Utukok uplands calving area is a good first step in balancing oil and gas development and wildlife resources in NPRA. However, the Teshekpuk withdrawal is inadequate when compared to recommendations by the Fish and Wildlife Service, the National Park Service's National Natural Landmark program, the University of Alaska's tundra biome program, the U.S. House of Representatives recommendation in 1979 of wildlife refuge designation, and BLM's own recommendations as a special area. The Sierra Club supports expanding the withdrawal to include, at a minimum, the boundaries of the Teshekpuk Special Area. The Teshekpuk Lake area needs a buffer zone of protection from oil and gas activities in adjacent areas.

The DEIS acknowledges that migratory waterbird ecology has not received thorough study. Studies should be undertaken and completed before oil and gas activity is allowed in areas of critical importance like Teshekpuk Lake. The national and international significance of the waterfowl resource merits extending this protection.

In the analysis on page 81, there is no consideration of the cumulative impacts of development on geese and other waterbirds. The DEIS states that one field, 60-80 square miles drained, may not measurably affect total populations. This statement appears to conflict with comments on page 50, "fish and wildlife

2.

The BLM feels that the Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) adequately addresses your comment and recommends long-term solutions within both the leasing and permitting processes.

3.

Final EIS Figure 20, p. 81, lists examples of special lease stipulations that were developed in consultation with the U.S. Fish and Wildlife Service to protect peregrine falcons. The BLM intends to consider all suitable sites in NPRA as potential peregrine falcon nest sites in any permitting process and provide suitable protections for other raptors as well.

4.

The Final EIS Preferred Alternative, p. 126, (see Chapter Five) recommends a Special Management Zone (SMZ) along the Colville River to protect the peregrine falcon and to conserve the diversity of its other values. This SMZ has no bearing on the Colville River's wild and scenic study status. The BLM feels the SMZ is an adequate conservation measure and will not usurp, through administrative deletion, a Congressional prerogative to withdraw river reaches from leasing by designation as wild and scenic before September 1984.

5.

The ecological importance of the area surrounding Teshekpuk Lake is recognized. It has been reanalyzed in the Final EIS along the lines of the past recommendations that you have pointed out and by application of more current understanding. The Preferred Alternative as shown on Plate One, last page, recommends conservation of these values through a combination of administrative deletions and a Special Management Zone.

6.

The Preferred Alternative, p. 126, (see Chapter Five) addresses future NPRA studies.

7.

Poor wording in the Draft EIS has been corrected. The Draft EIS may have led a reader to believe that drainage of surface wetlands was necessary in a development. The Final EIS correctly points out that this is a drainage of subsurface petroleum resources.

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Page Three

habitats within or adjacent to the field could be physically altered and/or adversely influenced by oil activities." This section further states drilling wells require draining the surface. What is the cumulative impact of several of these fields, especially in an area as critical as Teshekpuk Lake?

The Sierra Club also supports deletion of the Utukok uplands from oil and gas leasing. We feel the area should be expanded to match the recommended boundaries of the Utukok Special Area. The Western Arctic caribou herd relies on this habitat for its calving ground. Additionally this area contains many sites of archeological, geological, and ecological significance not related to caribou calving which merit protection.

The effort to delete high value fish and wildlife areas is diluted by the provision for eliminating withdrawals. The DEIS states the impacts of development in the withdrawn areas would be summarized from the DEIS for public comment. This will offer the public little information since the DEIS contains no thorough discussion of the impacts of oil and gas leasing in the deleted areas. General discussion is included, but no detailed, site specific information is available. If the areas are not withdrawn, what will be the next level of protection?

The restriction on surface occupancy is a welcome measure. Unfortunately, "no surface occupancy" is not clearly defined. What type of structures does it prohibit? A drilling pad will still be required. This is a form of surface occupancy. The 30-80 square miles of wetland will still be drained. The DEIS needs to specifically detail what the "no surface occupancy" restriction includes.

The DEIS fails to mention the Nigu-Etiviluk and Utukok wild and scenic study rivers. No alternatives are discussed for treatment of these areas under various oil and gas leasing scenarios. What type of protection will be afforded these rivers? What will occur in the event Congress does not designate them as part of the Wild and Scenic Rivers System?

The Risk Factor analysis for wildlife species is insufficient. Under "exposure to development" no mention is made of roads and pipelines, overflights disruptive to nesting waterfowl and raptors, and other types of exposure besides direct contact. We question the zero exposure rating for fish, wolves, wolverines, dall sheep, shorebirds, ducks, whistling swans, and fox. No scientific justification is given for this rating. Since most of NPRA is available (and some deleted areas may become available) for leasing, every species faces some degree of exposure. With 50 workers at each drill site, foxes may be hand fed. Will shorebirds, ducks, and swans be exposed to stress and potentially fatal increased energy use from development disruptions just like geese? These discrepancies in risk factors are confusing and seemingly inconsistent.

8. The value of the Utukok Uplands is recognized and has been conserved in the Preferred Alternative (Plate One, last page) through a combination of administrative deletion and Special Management Zone recommendations.
9. The Draft EIS did not clearly distinguish between an administrative deletion and a Congressional withdrawal. The Preferred Alternative, p. 126, in Chapter Five explains the recommended public process required to return a deleted area to the leasing program. The next level of protection beyond an administrative deletion is a Congressional withdrawal.
10. The Draft EIS discussions of "Limited Surface Occupancy" and "No Surface Occupancy" were confusing. The Final EIS Preferred Alternative, p. 126 in Chapter Five recommends the use of these concepts as both Special Management Zone designations for the leasing process and use of site-specific surface occupancy restrictions in the permitting process. As previously stated, surface drainage will not be required.
11. Final EIS Figure 14, p. 50, and Plate One, last page, identify these rivers. The Preferred Alternative in Chapter Five discusses treatment of the study rivers in the recommended leasing program.
12. Exposure of a few individuals should not be confused with exposure of a total population. The BLM does not intend to imply that there will be no site-specific habitat damages from development. "Exposure to development" as used in the Draft EIS referred to exposure of significant portions of a population to impact. Nevertheless, your comment and others prompted a reanalysis of the Draft EIS "numerical rating system." This system has been replaced with a more subjective system which eliminates "exposure" as a particular risk factor.

Mr. Jerry Wickstrom  
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Page Four

Overall, the presentation of information in the DEIS perplexing. Certain language and wording is vague and ill-defined (i.e. special management zone, surface occupancy). The information is not presented concisely; the reader has to keep referring back to other pages and plates without any references. Upon occasion, the information seemed contradictory. For example, will 30-60 square miles of drained wetland have an adverse impact on waterfowl? If so, how? Is it irreversible? What mitigation measure will help correct the problem?)

The Preferred Alternative suggests that areas suitable for design solution leasing will be identified during tract selection. The DEIS should instead recommend areas suitable now for design solution leasing. The public needs to have some indication of when and what types of "notable biological resources" merit such treatment.

Thank you for the opportunity to comment.

Sincerely,

*Sally Kabisch*

Sally Kabisch  
Assistant Alaska Representative

13.

13. The BLM feels the Final EIS responds to your comments.

14.

14. The BLM and the Final EIS agree with your comment. The Preferred Alternative, p. 126, in Chapter Five recommends that all permitting processes on NPR-A incorporate a Design Solution Concept. Within Special Management Zone Areas (SMZ) the Design Solution would become mandatory as a stipulatory requirement.

# Alaska Oil and Gas Association



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December 7, 1982

Rec'd  
12-8-82  
dj

Bureau of Land Management  
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NPR-A (916)  
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Anchorage, Alaska 99513

Attn: Mr. Jerry C. Wickstrom  
NPR-A Program Manager

## DEIS on Oil and Gas Leasing and Development in the NPR-A

Gentlemen:

Alaska Oil and Gas Association is a trade association whose 39 member companies account for the bulk of oil and gas exploration, production, and transportation activities in Alaska.

General Issues  
We have reviewed the Draft Environmental Impact Statement (DEIS) for oil and gas leasing and development in the National Petroleum Reserve in Alaska (NPR-A). The format is a refreshing change and we believe the document is adequate under NEPA guidelines. However, we find the DEIS to be overly negative in the assessment of predicted impacts to a number of wildlife species. As a result, mitigating measures have been recommended which are inconsistent with current operating procedures throughout the remainder of Alaska.

Stipulations which were developed by U.S.G.S. during the early phases of oil and gas activities have evolved into a current set of successful operating procedures. This opinion was echoed by Commissioner John Katz of the Alaska Department of Natural Resources in his recent comments on the North Slope Borough's draft Comprehensive Management Plan:

"Inherent in the borough's plan is the assumption that oil and gas activities are incompatible with the subsistence lifestyle of the Borough's residents. I question this assumption, especially in light of the limited impact that the existing oil and gas activity has had on fish and wildlife resources on the North Slope. While some habitat

## Response to AOGA's Comments

1. The mitigating measures recommended in the Final EIS Preferred Alternative, p. 126, in Chapter Five meet BLM requirements and are consistent with P.L. 96-514 directives. In principle, they are believed to be consistent with State of Alaska requirements, CZM and North Slope Borough policy.
2. The BLM agrees that further NPR-A exploration for petroleum resources will have insignificant impacts if conducted using stipulations required for the Federal exploration program. The Preferred Alternative, p. 126, (see Chapter Five) recommends use of "standard" stipulations (see Figure 20, p. 81) to the maximum extent possible but augments them with deletions and Special Management Zone stipulations where additional mitigation is appropriate.

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has been altered and some animals have been displaced, the cumulative impacts on fish and wildlife have not been significant. In addition, the impact of existing development on subsistence hunting and fishing activity also has been minor. While there are some who are sincere in their beliefs that oil and gas activity has been the cause of lower subsistence yields, I have not seen convincing evidence to support this cause and effect relationship. In the absence of new evidence, I am also confident that future oil and gas activity will not result in significant impacts to wildlife habitats or subsistence activity if the present level of environmental protection and concern resulting from state and federal regulations is continued."

Of the five alternative leasing strategies, AOGA supports the Standard Requirements Leasing Alternative. This alternative allows operations to be conducted anywhere within NPR-A in an environmentally sound manner. We do not support deletions or deferral of areas from leasing.

Attached are our detailed comments which we believe would improve the overall content of this DEIS.

Thank you for the opportunity to comment on the DEIS.

Very truly yours,



WILLIAM W. HOPKINS  
Executive Director

WWH:mm1:121  
Attachment



Detailed Comments of the  
Alaska Oil and Gas Association  
on  
DEIS on Oil and Gas Leasing and Development  
in NPR-A

- Page iv,v Caribou discussion - The caribou discussions meet but seem to go beyond NEPA requirements.
- Page 15 Caribou section - No mention is made of the multitude of studies completed since the TAPS construction. Caribou do seem to have more difficulty or reluctance in crossing roads with heavy traffic, but pipelines with crossings built in do not constitute a barrier.
- Western Arctic Herd - The use of all in the first sentence is not appropriate.
- Page 19 Paragraph 2 - Access to all of NPR-A does not guarantee a population maintenance or increase. As stated previously, there are normal population fluctuations.
- Central Arctic Herd - The wording of sentences 5 and 6 seems to indicate that the CAH responses are not what the writer believes they should be. This section should be written more objectively. The words "in spite of" should be replaced with "in the presence of".
- Page 31 The value of paragraphs 5 and 6 is questionable.
- In paragraph 5, sources should be identified or compared foods listed.
- In paragraph 6, listing food prices and concluding that many cannot afford them is not valid from the data presented. Anchorage prices can be just as prohibitive for some people. The statement concerning the 65 families is incomplete. Is this a representative sample? An objective assessment of the situation is not possible from the facts provided.
- Page 32 Cash Economy - What has caused the cash increase? How have the people benefitted? If this cash increase is due to employment directly in petroleum production or indirectly through an increased NSB tax base, this fact should be documented.
- Page 36 Cultural Resources, Paragraphs 2 and 3 - Who is charged with the Historic Sites decision and what type of investigation will be necessary by the archaeologist? The quotation at the end of paragraph 2 does not indicate anything more unique about NPR-A than the rest of the

3.

3. The Final EIS caribou discussions meet NEPA requirements because specific revisions were made to reflect recent caribou studies. However, caribou have been found on all of NPR-A.

4.

4. The text has been appropriately revised.

5.

5. The text has been appropriately revised to more clearly indicate Permittee responsibilities. A cultural resource inventory is primarily a Permittee responsibility. The Council on Historic Preservation is ultimately charged with "Historic Sites" decisions.

U.S. land surface. Between identified and by of paragraph 3, insert the words "as having significant historic or cultural potential".

Recreation & Primitiveness - This section is lengthy and could be condensed.

### CHAPTER THREE

Page 42 Exploration, Paragraph 1 - Quite possibly, more than one exploratory rig would be used for exploration and delineation within the NPR-A.

Page 53 Oil Spill Risk and Response Analysis - AOGA recognizes the use of current data, however, we are concerned about the inclusion of the TAPS sabotage incident without paranthetical notation.

Page 58 Proposed Stipulations - the proposed data gathering by applicants under this permitting procedure is not consistent with existing state and federal regulations in other areas of similar habitat within the state of Alaska. The collection of this type of data is extremely time-consuming and expensive. This requirement for any study should be an exception rather than a rule.

Page 59 Stipulation for Whistling Swan, Duck and Shorebird Protection - This stipulation effectively closes the coastline to any petroleum related activities since there are few places on the coast that are not within six (6) miles of nesting, molting, or staging area. Furthermore, there are no studies of which we are aware which support such an unreasonable set of stipulations. If the intent of this stipulation is less restrictive than we have interpreted, the entire stipulation should be more clearly stated.

Page 60 Stipulation for Wolverine Protection - The last two sentences are inappropriate for a specific permit. These studies should be undertaken by a public agency with public funds to better understand the ecology of the wolverine, if this allocation of public funds is in the public's best interest.

Standard Alaska operating practices already dictate the precautions included in Stipulation 4 and 5.

Page 61 Fisheries, Paragraph 4 - There are a number of construction practices that would minimize if not completely eliminate siltation.

6.

6. The text has been appropriately revised.

7.

7. The text has been revised to more clearly indicate that these are example or model stipulations applicable to a leasing or permitting process. Chapter Three, p. 55, in the Final EIS has been rewritten to illustrate requirements the BLM is prepared to make in a permitting action to mitigate likely impacts.

8.

8. The BLM agrees.

Page 62 Water Quality - Proper disposal in lined pits, or those with permafrost barriers, have not resulted in a significant introduction of toxic chemicals into the environment.

#### CHAPTER FOUR

This chapter uses a two-step test for "likely" and "significant" statements of impact (would statements), and the sparse use of the word "could" for impacts that may happen. The two-step test appears to be designed to satisfy the requirements of Public Law 96-514 (Interior Appropriations Act of 1981) which calls for recognition and mitigation of "reasonably foreseeable and significantly adverse impacts." We are concerned that that the interpretation of the words "likely" and "foreseeable" by the Environmental Impact Statement (EIS) team may have been more intuitive than reasonably required. The impact analyses appear to be based predominantly on intuition, at times in conflict with documented observation, and could lead the public, and a decision maker using this document, to negative conclusions concerning the impacts of oil and gas exploration, development and transportation in the sensitive environment of the NPR-A.

This concern is typified by the analyses in the section Impact to Caribou Analyses Under Standard Leasing Requirement. As noted in the DEIS, no precise predictions exist of the response of caribou to the intrusion of unknown levels of human developments (p. iv). Also, the Caribou Discussion Panel (CDP) could not quantify impacts or predict changes in demography of the arctic caribou herd (p. 66). The EIS team, in fulfilling their NEPA obligations to quantitatively assess impacts, may have built a worse than reasonable "worst case" summary, using the qualitative analysis of the CDP and several intuitive simplifying assumptions.

As an example, we will discuss analytical Case #1, Upper Colville River developments. The CDP states that:

"There is a 90 percent possibility that 20 percent or more of the population would encounter the corridor at this (precalfing movement) time in a given year."

"Encounters associated with post calving is viewed as the one most likely to have significant adverse impact..."

"Roughly 50 percent of the population would be expected to encounter the long east-west segment of the corridor..."

In the quantitative analysis section of this area, a set of intuitive simplifying assumptions are made as follows:

9.

9. The Final EIS has been revised in response to this comment.

10.

10. Comprehensive analyses in Chapter Five, p. 121, have been revised, where appropriate, in response to this and other similar comments.

1. "Pregnant cows or cows with calves would not cross any corridor."
2. "Fifty percent of the pregnant cows or cows with calves would encounter the corridor each year in the precalving migration and have to travel around the corridor..." (emphasis added)

We feel that these assumptions are predominantly based on intuition, and are in conflict with observation, specifically in the Kuparuk River Unit oilfield. First, pregnant cows may or may not cross corridors. Second, the assumption of a 50 percent encounter rate in precalving migration is in direct conflict with the 18 percent probability discussed by the CDP.

Using these simplifying assumptions, the EIS team calculates an increased mortality rate of 945 cows per year. Using the CDP's 18% figure, an assumption that only 50% of the cows would be in the highly sensitized peak calving time at encounter, and that only 50% of these cows would avoid the corridor (based on Kuparuk observations), a more reasonable "worst case" analysis would indicate only a 288 increase in mortality. This is less than one-third of one percent of the cows, and less than two-tenths of one percent of the population.

These inaccuracies and the tone of the writing of the DEIS could lead the public to assume significant depletion of the Western Arctic Herd, with concomitant desertion of the Brooks Range and significant adverse impacts to the subsistence lifestyle of the people of the area. We do not feel that this is an accurate "worst case" analysis, and suggest that available observations from Kuparuk be utilized in this analysis.

Page 1861 Summary of Hypothetical Impacts for Analytical Case #1 - "Effect on WAH range would be desertion of all passes and ranges on the Arctic Slope east of Howard Pass and areas south of the corridor." "Effects on CAH range would be desertion of range south of Umiat to the TAPS pipeline..."

Simplifying Assumptions for Analytical Case #1 - "Fifty percent of the pregnant cows or cows with calves would encounter the corridor each year...and have to travel around the corridor and Liberator field equal to a 42 percent greater travel distance...(to calving grounds)."

From other observations we believe it much more likely that the caribou would either 1) go ahead and cross the corridor, or 2) in case some pregnant cows would not cross, they probably wouldn't travel the 42 percent greater distance and time to the traditional grounds, but would more likely choose an alternate calving site.

Summary of Hypothetical Impacts for Analytical Case #2 - "CAH - the extension of the present Prudhoe Bay-Kuparuk

haulroad into NPR-A may become highly significant. The CAH's pregnant cows and cows with calves would lose unhindered access to the area north of this road..." Again, we suggest that the present Prudhoe-Kuparuk road has not had a significantly adverse effect on the CAH.

Page 71 Summary of Hypothetical Impacts for Analytical Case #3 - The EIS team predicts that the WAH would be split into 2 herds, presumably because there would be no crossing of the road/pipeline corridor extending easterly across southern NPR-A. We very much doubt that probability. The CDP assume that the northern portion of the herd will overpopulate and crash because of reduced predation. We feel it is a credible alternative that predators would follow the herd and help to keep the population down. Also, it is possible that the herd could attain a state of balance with the northern area rather than overpopulate.

Page 81 Comprehensive Analysis of Geese - The WDP identified in their initial assumptions that migratory waterbird ecology on NPR-A has received few intensive studies. In addition, the panel identified as a major problem in assessing impacts the fact that there is a lack of information on changes in goose molting patterns. In light of these assessment deficiencies, it seems unreasonable to recommend no surface occupancy of some areas.

Page 90 Design Solution Alternative - We agree that the current leasing and permitting stipulations listed in Plate 9 of the DEIS have proven effective in controlling impacts of NPR-A exploration. We therefore see no need whatsoever of an additional set of stipulations. Each facility permit will inevitably be negotiated on an individual and site-specific basis, as has been the rule in the Prudhoe-Kuparuk area.

The design solution alternative (DSA) should serve simply as a guideline for regulators and lessees and not a leasing stipulation or regulation. The DSA, as is described here, is so inflexible that it could preclude surface development in certain areas if rigorously implemented as a leasing stipulation. Similar stipulations were applied when oil and gas operations were in their infancy in Alaska. However, current operational practices are not so restrictive and have stood the test of time to demonstrate minimal impacts to renewable resources.

Page 91 Proposed Wildlife Protection Stipulation Minimum Requirements - We believe that the identification of detailed wildlife occupation and use in NPR-A should be the purview of experienced wildlife biologists of the U.S.

11.

11. The intended BLM definition of no surface occupancy is stated in Chapter Four, Section I. A. 1., p. 83.

12.

12. The BLM agrees that stipulations similar to those in Final EIS Figure 20, p. 81, are effective in controlling impacts of exploration, and we plan no additional "sets" of stipulations. The Preferred Alternative, p. 126, in Chapter Five recommends only one new special lease stipulation, the Special Management Zone stipulation. Your assumption is correct that each permit will be reviewed on an individual and site-specific basis including further NEPA compliance.

As your comment suggests, the Design Solution Concept has been incorporated into Preferred Alternative, p. 126, as a "guideline." More specifically it has been included in the Special Management Zone stipulation recommendation.

13.

13. Please refer to response #7 concerning text revisions. However, the BLM feels that the Lessee must share the cost of wildlife studies that adequately assess the implications of a proposed action. The BLM intends to pursue cooperative studies of the NPR-A using our own wildlife biologists as well as those from the State of Alaska, North Slope Borough, petroleum industry, and the U.S. Fish and Wildlife Service. If BLM alone is to design all mitigating measures without the support of the Permittee, we may not be able to produce timely and adequate permitting decisions.

Fish & Wildlife Service, not of oil and gas operating companies. Such determinations, started from scratch, could take several years, and are clearly outside the expertise of operators. The task of the BLM is to tell us what mitigating measures are necessary, and industry's task is to devise a satisfactory compliance with such measures.

Page 93 Processing Procedures - The oil and gas industry fully understands the ramifications of the Endangered Species Act, and has gone to and will go to great and expensive lengths to accommodate its provisions in the Arctic and elsewhere.

Plates 3 & 4 Please note that the reference to NSO areas on pages 65 and 81 refer to Plate 3 and not to Plate 4.

Page 100 Preliminary Identification of a Preferred Alternative - Over ten years of study of the Central Arctic Caribou herd, which partially calves in the Prudhoe and Kuparuk oil fields has not shown any detrimental effect on the caribou population. On the basis of this information, it is reasonable to assume that carefully planned exploration, production and development within the Utukok uplands CORE calving area would not negatively impact the caribou population.

The DEIS provides no basis to support the withdrawal of black brant molting habitat from a scheduled lease sale. This DEIS predicts that no blowouts will occur during lease activity. Predicted non-pipeline spills would most likely be contained within previously disturbed areas (e.g. gravel pads, roads, etc.) and would have limited or no impact on molting populations. In the event of a pipeline spill at a stream or river crossing, "significant" impacts would be unlikely utilizing currently practiced in the petroleum industry.

Methods

14.

14. The BLM appreciates the petroleum industry's commitment to protection of endangered species.

15.

15. The BLM is aware of the specific findings of Central Arctic Herd studies. None of them definitively supports a reasonable conclusion that development in the deleted central calving area "would not negatively impact the caribou population."

16.

16. The molting area containing the highest density of black brant was deleted after consideration of all types of likely development impact including oil spills. Please refer to discussion in Final EIS Chapter Four, Section I.A.5, p. 99.

# CITY OF BARROW

"The first north incorporated city"  
BOX 629  
BARROW, ALASKA 99723  
PHONE (907) 852-5211

December 9, 1982

Mr. Jerry Wickstrom  
Program Manager  
NPR-A, Bureau of Land Management  
Alaska State Office  
701 C Street  
Anchorage, Alaska 99513

Dear Mr. Wickstrom:

For the record, my name is Nate Olemaun and I am the elected Mayor for the City of Barrow.

As an official elected to represent my community, I feel that my views are representative of the community as a whole. We have grave concerns about the effect that oil development activities will have on our environment. Our culture is closely tied to and in tune with the cycle sequence of nature. To disrupt or change nature's cycle is to alter the foundation of our cultural heritage.

We realize that we are presently in a state of constant change. It is our cultural heritage that gives us strength, pride, and guidance during this phase of Inupiat development. We realize the need for the development of the natural resource industry here on the North Slope, and we realize the benefits that we receive from such development. The City of Barrow has gone on record before, and will again state off the record, that we are not opposed to the rational, orderly development and extraction of our natural resources. However, we are opposed to resource development when it threatens the very existence of our cultural being. In the case at hand, we feel that the present levels of technology are not sufficient enough to guarantee that the environment and wildlife resources we depend on for cultural and physical survival will be unaltered or undamaged, to a degree that will insure our continued mutually beneficial relationship between the Inupiat people and their environment.

In reviewing the Environmental Impact Statement (EIS) for the proposed oil and gas leasing and developments in the National Petroleum Reserve, I must admit that I found it difficult reading at times. I will leave to those more learned than I to expound on the discrepancies of the report, and to point out how the present levels of technology can offer us no assurances of an accident free development, extraction, and transportation of oil and gas. In many instances our respected elders have shared with us their vast experiences

## Response to Mayor of Barrow's Comments

Your statement about the importance of the land to the Inupiat people and the need for rational, orderly development and extraction of NPR-A's natural resources is supported throughout the Final EIS. While scientific methods are used in BLM decisionmaking, we also continue to consider the elders' knowledge in NPR-A's management. Accidents are always a possibility. However, the BLM's stipulations and other requirements that guide each activity in NPR-A reduce the possibility of catastrophic accidents to the low risk category. The Preferred Alternative, p. 126, (Chapter Five) addresses most of your concerns. Through mutual cooperation, the Inupiat knowledge combined with scientific methods can achieve our common goals.

Mr. Jerry Wickstrom  
December 9, 1982  
Page 2

and observations. Yet simultaneously, the scientific community and oil industry officials have refused to accept their expertise. The Elders expertise gained from not only a life time of experience and interaction, but also from an inbred closeness with the forces of nature that dates back not hundreds of years but thousands of years. True, many of the Inupiat experts may not be able to explain in precise mathematical formulas or equations why nature acts in a certain way, but when our Inupiat experts teach, we listen.

When it comes to deciding between the credibility of a learned scientist who has based his information on data gathered mostly in the last 15 to 25 years, or that of a learned arctic expert who bases his judgment not only upon his lifetime of experience, but upon the countless lifetimes of experience of his ancestors, I will choose the Inupiat expert over the scientific expert every time. When an Inupiat expert says something will happen, it is just a matter of time until it comes to pass.

In closing, I would like to say once again that the Inupiat people depend upon their environment and wildlife resources for their cultural and physical survival. It would only take one accident to disrupt the sensitive balance we have achieved with nature through countless years and generations. It has been our experience that the greatest good for the greater number is often given as an excuse for allowing progress to continue at the expense of a few. If such must happen in this case, we would urge that our voice be heard and the damage be as minimal as possible. I formally ask that the advise and wisdom of our Inupiat elders be followed.

Respectfully yours,

*Nate Olemaun*  
Nate Olemaun,  
Mayor, City of Barrow

NO:ka





## National Audubon Society

ALASKA REGIONAL OFFICE  
308 G STREET, SUITE 219, ANCHORAGE, AK 99501 (907) 276-7034

December 10, 1982

Mr. Jerry Wickstrom  
Program Manager  
National Petroleum Reserve - Alaska  
Bureau of Land Management  
Alaska State Office  
701 C Street, Box 13  
Anchorage, AK 99513

Dear Mr. Wickstrom:

These are comments and recommendations of the National Audubon Society on the Draft Environmental Impact Statement (DEIS) on Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska (NPR-A), dated October, 1982. We find the DEIS inconsistent with the intent of NEPA, and so seriously deficient in its treatment of national interest surface resources that we recommend it be redrafted and resubmitted for public review.

Major shortcomings in the DEIS that need to be thoroughly addressed include the following:

1. The discussion of impacts related to oil and gas leasing across the petroleum reserve are hypothetical since an actual leasing program, including alternative locations and schedules of leases, is not included. Is such a program being developed independently from the DEIS? If so, what is the justification for this?
2. The cumulative impacts of multiple lease sales within the NPR-A are not addressed, nor those associated with oil and gas leasing in adjacent areas of the

AMERICANS COMMITTED TO CONSERVATION

Received 12/14/82  
NPR-A, mTB

RECEIVED  
NPR-A  
DEC 13 1 05 PM '82  
ANCHORAGE AK

### Response to National Audubon Society's Comments

1. Consistent with both the intent of NEPA and P.L. 94-514, the programmatic approach of this Final EIS in its treatment of national interest surface resources has a solid foundation in the extensive data base of previous NPR-A studies referenced throughout this EIS.
2. The Draft EIS presented alternative leasing programs in the format of illustrative plates. This Final EIS presents three separate narratives of alternative leasing programs and selects a Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page).
3. This Final EIS continues the Draft EIS technique of considering probable effects on high risk resources and issues on or adjacent to the NPR-A. Although technically it is beyond the scope of this EIS, a brief model of hypothetical Arctic Slope concurrent developments is included in Chapter Five, p. 121.

North Slope, i.e., Kuparuk and Prudhoe Bay. What cumulative impacts will result from multiple oil and gas leases on NPR-A?

3. Areas of high, medium, and low hydrocarbon potential are not identified nor the specific surface values of those areas thoroughly discussed. Where are commercial quantities of hydrocarbons most likely to be found in the NPR-A based on best available scientific information? What are surface values in those areas, and what mitigative measures will be applied to minimize adverse impacts on them?
4. A surface transportation network, including roads, that may prove necessary to support development in the petroleum reserve is not identified. What transportation infrastructures are foreseen in the NPR-A, and what will be their impacts on surface resources, subsistence, and recreation opportunities?
5. The conclusion that there will be no "medium" or "major" oil spills in the NPR-A is not explained or justified. On what evidence is this conclusion based?
6. The topic of contaminants (hydrocarbons, heavy metals, drilling muds, etc.) from possible oil and gas development is inadequately addressed. What specifically will be done by BLM to determine the fate of spilled contaminants and to provide for clean-up contingency planning? Will a multi-disciplinary monitoring program be established to ensure protection of vegetation and fish and wildlife resources from environmental contaminants?

4.

4. Hypothetical development models shown in Chapter Three, p. 55, provide likely scenarios for analysis.

5.

5. Several hypothetical transportation networks were developed in this EIS to correspond to the discovery of the various hypothetical fields. The BLM cannot predict any "actual" networks at present. Such actual networks would require specific NEPA compliance analyses in the permitting process.

6.

6. This Chapter Three, p. 55, discussion has been completely revised in the Final EIS to be responsive to this and other comments.

7. Areas of outstanding biological values including the entire Cape Halkett/Teshekpuk Lake wetlands complex, calving grounds of the Western Arctic caribou herd, and Colville River bird of prey habitats have not been deleted from possible leasing nor identified for permanent classification in an appropriate protective status. Why is not the entire caribou calving ground of the Western Arctic herd, as identified by the Alaska Department of Fish and Game, not being recommended for protection? Why were recommendations of the U.S. Fish and Wildlife Service for protection of the Teshekpuk Lake goose molting area not adopted?

8. The levels of protection prescribed for surface resources in the preferred alternative are inadequate. What are the reasonable alternatives for protecting fish and wildlife throughout the preserve? Will cooperative management be encouraged?

9. Despite the fact that the entire area is essentially defacto wilderness, national interest wilderness values are not even recognized let alone thoroughly discussed. What is the magnitude of the wilderness resource on NPR-A and how will national interest wilderness values be protected?

10. The need for expanded multi-disciplinary research to provide additional baseline data necessary to guide oil and gas leasing and development, and for monitoring of operations to minimize environmental damage are not identified or discussed. Does this mean ongoing multi-disciplinary research and monitoring are not deemed necessary or desirable on NPR-A?

The National Audubon Society, including its more than 2,000 members in Alaska, has a special interest in the many nationally and internationally significant wildlife values on NPR-A.

7.

7. The Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) recommends adequate conservation measures for these areas, including partial deletions.

8.

8. The conservation measures recommended in the Final EIS Preferred Alternative, p. 126, are reasonable and adequate. The BLM fully intends to cooperate with the State of Alaska and North Slope Borough in making management decisions.

9.

9. P.L. 96-514 precludes the designation of wilderness areas in the NPR-A. However, conservation of its primitive qualities is a legitimate multiple use objective. A prime objective of site rehabilitation will be to restore a measure of its original primitive character.

10.

10. The Preferred Alternative, p. 126, in Chapter Five recommends a cooperative study program.

We are particularly concerned, therefore, that the DEIS fails to fully recognize these values, or to prescribe measures that will assure that oil and gas leasing on the reserve will not unduly jeopardize them.

The Western Arctic caribou herd is Alaska's largest. It also constitutes one of North America's major free-ranging herds of ungulate mammals. The herd ranges throughout the NPR-A and calves there. Professional wildlife biologists have repeatedly stressed that protection of the entire calving grounds in the Utukok uplands is vital to maintaining this great herd's viability, and so too that of its major predators such as wolves and grizzly bears. It is well documented by biologists that cow caribou avoid areas of major human disturbance or development from the time immediately preceeding parturition until several months after giving birth to their calves. We are, therefore, extremely disappointed to find the "Utukok Caribou Cow Calving Grounds", depicted in the DEIS as Area 2, Plate 4, to be only a small portion of the traditional historic calving ground.

There have been numerous recommendations in recent years by resource agencies and public interest groups to establish a Teshekpuk Lake Special Management Area. The principle aim is to protect nationally and internationally significant wildlife values in this naturally diverse Arctic wetland complex. The Cape Halkett/Teshekpuk area is particularly important for molting geese (especially black brant); comprises the entire range of the Teshekpuk Lake caribou herd, supports known denning of polar bears and arctic fox, and is inhabited by a diversity of waterfowl, waterbirds, and shorebirds. The entire complex depicted in the DEIS as Area 4, Plate 3 and Area 1, Plate 4 should be withdrawn from leasing or any other kind of development, and permanently dedicated to the conservation of wildlife.

Coastal lagoon systems are among the most biologically productive ecosystems along the coast of NPR-A. Kasegaluk Lagoon

11.

11. The Preferred Alternative, p. 126, prescribes measures that assure that oil and gas leasing on the Reserve will not unduly jeopardize the many nationally and internationally significant wildlife values on NPR-A.

12.

12. The Preferred Alternative (see Plate One, last page) recommends adequate and reasonable conservation of the calving zone and Teshekpuk Lake area with respect to P.L. 96-514 directives.

13.

13. With the passage of ANILCA, the Chukchi Sea coast passed to U.S. Fish and Wildlife Service management as a part of the Alaska Maritime National Wildlife Refuge. These areas are not presently available for leasing under NPR-A authorities.

for example, is one of the most important marine mammal and bird concentration areas on the Alaska Chukchi Sea coast. This lagoon supports the largest summer concentration of Beluga whales and ringed seals in the Alaska Chukchi Sea. The whales gather here annually for calving, rearing of young, and feeding. During these critical periods of their life history, the whales are particularly sensitive to disturbance. Yet, the DEIS fails to provide a thorough analysis of possible adverse impacts on these important marine mammals, or how they and their habitats can best be provided protection.

Because of their significance to wildlife and subsistence, Kasegaluk Lagoon and other coastal ecosystems including Peard Bay, Elson Lagoon, Dease Inlet, and Kogru River, Harrison Bay and all barrier islands should be identified for protection.

The NPR-A is noted for its unique population of the endangered Arctic peregrine falcon, as well as other raptorial birds including gyrfalcons, golden eagles, and rough-legged hawks. Greater precautions need to be taken to protect raptor nest sites, and to permanently protect critical breeding and feeding habitats. Opportunities for range expansion of these birds within the NPR-A also need to be assured.

The BLM is urged to address the issue of proposed designation of a "Colville River Bird of Prey Natural Area" in the Colville River drainage because of this river corridor's nationally significant nesting raptor populations.

In summary, we find the DEIS for oil and gas leasing in the NPR-A seriously deficient in numerous respects. Nationally and internationally significant surface resources are not adequately described; the preferred alternative does not assure adequate protection to surface resources; analysis of environmental impacts and mitigation measures are incomplete; and precautions necessary

14.

14. The areas you mention on the Beaufort Sea coast have been recommended for Special Management Zone designation in the Preferred Alternative in Plate One, last page.

15.

15. The Preferred Alternative, p. 126, recommends designation of a Special Management Zone along the Colville River specifically to conserve its diversity of values (see Plate One, last page). Consideration of a "Colville River Bird of Prey Natural Area" is beyond P.L. 96-514 directives and the scope of this EIS.

16.

16. This Final EIS adequately describes significant surface resources and their conservation in the Preferred Alternative, p. 126, recommendations which adhere to P.L. 96-514 directives. The analyses of impacts and mitigations are complete under NEPA guidance, and reasonable precautions to avoid unnecessary surface damage and minimize ecological disturbance throughout the Reserve also are prescribed in the Preferred Alternative, p. 126. Site-specific concerns will be further addressed in the required NEPA compliance for any permitting process. Federal and State environment laws will be complied with and current "state-of-the-art" Arctic technologies required.

to avoid unnecessary surface damage and to minimize ecological disturbances throughout the reserve are not prescribed. Thus, we request that the DEIS be redrafted and resubmitted for public review.

Your consideration is greatly appreciated.

Sincerely,



David R. Cline  
Regional Vice President

cc: Governor Bill Sheffield  
Dr. Russell Peterson, National Audubon Society  
Dr. Rupert Cutler, National Audubon Society  
Bill Butler, National Audubon Society  
Ken Berlin, Winston & Strawn  
John Warden, Anchorage Audubon Society  
Bud Lehnhausen, Arctic Audubon Society  
Lori Cooper, Juneau Audubon Society  
Rich MacIntosh, Kodiak Audubon Society  
Durwood Zaelke, Sierra Club Legal Defense Fund  
Eric Smith, Trustees for Alaska  
Michael Bean, Environmental Defense Fund  
Alaska Conservation Organizations  
Bud Stevens, North Slope Borough

NORTH SLOPE BOROUGH  
P.O. BOX 69  
BARROW, ALASKA 99723  
TELEPHONE 19071 852-2611

Rec'd  
10-2-82  
JL

November 29, 1982  
COMMENTS ON SUBSISTENCE VS LEASE SALE IN NPR-A

My name is Arnold Brower Jr. Born in Barrow on the winter of 1947. During the first four years of my life our family lived outside Barrow on the tundra rivers where food was abundant. The nets caught white fish from the Inaru, Meade and Alaktak rivers and nearby lakes. My father made his regular rounds to the nets spread throughout these rivers on dog sled at the same time checking his trap line for foxes, wolves, and wolverines. Occasionally, a polar bear was caught. This daily routine precisely followed by my father, kept on during the winter months. Prior to the springtime, the family packed up to head to Barrow for spring whaling and caught the seal oil supply during the summer months. Towards the fall, we pack up again and head inland to various rivers hunting for caribou. Sometimes the traveling took us from Barrow to Teshekpuk Lake thru the Ikpiuk River and back out to the Admiralty Bay into Alaktak, Chip, Meade rivers and back to Inaru River where we had a house, cellar and meat rack. We also lived seasonally in Alaktak since my grandpa Charles D. Brower passed away no one else hardly went there except our family. Until recently Uncle Tom Brower started going there. As I got to be of school age my family started to build a house in Barrow now Browerville area where my father is still residing. Each spring right after thawing, we continued going up the rivers especially where we had our houses in the Inaru River, Tasigroak Lake, north side, Sungwroak Lake on the south side and lately in the 1960's to the head waters of Chip River. Father often told of the reindeer herd he had before he got in the war. The areas of caribou corralling took him from Cape Simpson shore to the head water of Ikpiuk rivers and sometimes to Barrow. The Center being the Alaktak corral. Today, we have summer camp at Chip river and Ikpiuk river and winter camps at Tasikroak lake on the north side and another winter camp at Cape Simpson in the mouth of the Sinclair lake river. These areas are of trapping and hunting camps. The one at Tasikroak lakes is for early winter fishing for large white fish and trap line stop. We now pack up right after whaling to go to the spring-summer camp at Chip river and Ikpiuk river for geese hunting and fishing. Fish caught in spring and summer are dried so is the caribou meat. During the course of the winter my father and I will go up to the Ikpiuk camps and trap for red fox, cross fox, wolverines, and wolves, occasionally a

Response to Arnold Brower, Jr.'s Comments

The Preferred Alternative, p. 126, in Chapter Five recognizes the need for consultation and cooperation to aid in the conservation of the subsistence lifestyle on NPR-A. Its stipulations are proposed to prevent or reduce the impacts you describe, and it calls for cooperative studies to give the BLM, the State and the NSB the technical information necessary for proper management of the Reserve.

blue and silver fox is caught or a lynx. Some walrus and seal meat and oil we carry are left at the camps in the cellar for summer use. One year, my father took some small white fish from the nets and put them in a barrel and when their eggs were germinated (spawned) released them into Ikroakwik lake near Barrow and fished there till the NARL camp dynamited the lake to get some fresh water out of it. Since then no fish has been caught. If the oil and gas leases should develop so near the fishing areas, I would like to assist in stipulated and working on new fish harvesting lake areas for the benefit of the fish species and the nutritional needs of the Inupiat people of the North Slope. The scenario here is a seasonal nutritional culture the Inupiat here that we depend on for our health, mentally, physically and spiritually. I would like to emphasize the enhancement of mutual cooperation for the betterment of our life. First of all the resolvment of fuel high cost in the North Slope Borough. Second, the local hire programs to help alleviate the fuel cost, third guard the sensitive habitat of the North Slope tundra, lakes, rivers, ocean, and brushes. During the past, the BIA has done some mosquito control by squirting oily fluids to the ponds, lakes and waters in the Barrow area and this has had a detrimental impact on the small fishes in the area. The carelessness of the Navy by leaving large amounts of Diesel and fuel in the tundra and eventually they rust and the oil fluids have drained into nearby lakes and streams impacting again on the small fishes and wildlife. As we have learned, from experience and common knowledge, fishes cannot survive where toxic chemicals are in the waters. I must point out that large white fish inhabits only those waters that drain into the Beaufort Sea in the North Slope. During my life time I have found this out in search of fishing areas due to a near depletion of the species since the seismic studies starting. I am confident that the Dept of the Interior has potential funds to cooperating ensure that efforts to prevent extinction of fishes and other wildlife habitat, have been provided, if not that allocation for funding will be insured. The Commission of Fish & Game of the NSB am sure not apt to receive your proposals for maintaining habitat in the North Slope Borough along with your preparation for exploring for oil and gas. I also wish to express my concern for testing noise impact on the fish first by test explosion to a subsidized lake with fishes implanted there for proper stipulations as to how far from lakes and rivers seismic work can be done. Also that in drilling areas that pads be matted with visqueen material to prevent seepage outside the drilling compounds. Those areas to dredging should also be padding wherever possible by dredging the needed sand from shallow lakes so the lakes can be deepened for new over wintering areas for fishes. An alternate energy source may be then an ERDA program from vast coal quantity areas. This will enable a whole community to become self support in energy needs. It will create permanent jobs and will alleviate high fuel cost and provide necessary hot water systems to communities. I believe this is just a technical problem to initiate the programs to explore the North Slope for oil and gas. I further believe that the federal government has a duty to its people to resolve the technical



problems and provide the basic needs of oil to the nation effectively and timely. Due to a short notice on my part I apologize for a short comment, although that I didn't cover all the ground I needed to. Couple other important factors, the food of the fishes and the food of the caribou. As we all know, that caribou eats lichen for its nutritional needs. From my high school education, the lichen that the caribou eats does not grow to its original state for the next twenty years. I believe a developing Dept of the Interior can manage in areas of the tundra much like timber resource management, so that a growth pattern can be made and ensure the growth of food source for the caribou that is so essential for the health population in the North Slope Borough. Thru scientific research that a supplemental food source can be supplied for the aid of land displacement of lichen that is lost. A similar pattern of development can also be adopted with a purpose of mind to administer wildlife preservation proportionately with development by classifying areas of land already developed for periods of time so proper growth can start. Other vegetation programs are available so here I would not want to limit to a single source of revegetation program. In much the same way, I want to emphasize on the offshore development stages to stipulate with the use of visqueen or similar material laid out to a gravel island to prevent seepage of toxic fluids into the waters. I know, that the gravel islands are much safer than standing a rig to the ocean floor in the Arctic. I would oppose to bottom fasting ice and drilling on it because the ice has tendency to slide from impact of offshore ice floe. In conclusion, a conference table workshop to iron out the technical details of the Environment is a great potential resolution for both the Dept of Interior and the residents of the North Slope Borough. Although, negotiations are a vital tool in the conveyed areas of the village corporations and the ASRC. I wish to express my thanks for this privilege to comment on behalf of myself and residence of the North Slope. Again thank. As the North Slope residents have commissioned a Fish & Game board for an Home Rule government, that an initiative begin as soon as possible to resolve detrimental impacts of the permanent habitat of the North Slope. I again emphasize that this report is based on the area of subsistence, My father and family use. A scenario map is attached with points of seasonal use plotted. From listening to the State's attitude of Fish & Game Management, I believe that loss of habitat fish replacement for dollar value is detrimental for the long term survival of amphibious wildlife that is of nutritional necessity to the Inupiaq residents of the North Slope Borough.

cc: file

Mr. Jerry Wickstrom  
NPRA Program Manager  
BLM Alaska State Office  
701 C. Street  
Box 13  
Anchorage, AK 99513

Dear Mr. Wickstrom:

This letter concerns the NPRA leasing program. We are the people of the village of Wainwright and want you to understand how we feel about our land, lakes, streams and rivers. Our lives and our culture depend upon our ability to hunt and fish for food. We realize that our hunting and fishing grounds will be damaged as oil exploration and development go on. You do not have the right to force change upon us by affecting our hunting and fishing areas.

We ask you to help us to protect our lands and waters and to keep the environmental damage as small as possible. As the lease areas are sold you must have stipulations that keep drilling away from our hunting grounds and our fishing areas. Fish and caribou are so important to us. We must have buffer zones to protect our fish and caribou.

Rossman Peetook  
Box 43  
Wainwright, Alaska 99782

Sincerely,

*Rossman, E. Peetook*  
*Luke S. Kagark*  
*Charles Nayabik*  
*James D. S.*  
*William H. H.*  
*L. L. S.*  
*Bernard B. S.*  
*William H. S.*

Response to Wainwright's Comments

Changes throughout the Draft EIS resulted from the concerns of the people of Wainwright as expressed in public meetings and in this letter. The Preferred Alternative, p. 126, in Chapter Five targets your concerns that your subsistence lifestyle be conserved. As the people of Wainwright and the BLM continue to work together, decisions can be made to ensure environmental damages will be minimized.

**EXXON COMPANY, U.S.A.**  
POST OFFICE BOX 4279 • HOUSTON, TEXAS 77001

EXPLORATION DEPARTMENT  
ALASKA/PACIFIC DIVISION

FIELD OUT  
MANAGER

December 9, 1982

Draft Environmental Impact  
Statement on Oil and Gas  
Leasing and Development in  
the National Petroleum  
Reserve in Alaska

Mr. Jerry Wickstrom  
Program Manager, NPR-A  
701 "C" Street  
Box 13  
Anchorage, Alaska 99513

Dear Mr. Wickstrom:

Exxon Company, U.S.A., a division of Exxon Corporation, appreciates the opportunity to comment on the "Draft Environmental Impact Statement on Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska (NPR-A)". We applaud your efforts in attempting to balance environmental concerns with the goal of oil and gas leasing and development in the NPR-A. Issuing a single environmental impact statement for leasing in the reserve is particularly appreciated in that it will allow potential lessees to more efficiently plan and execute their activities in this area and develop any commercial hydrocarbons in an orderly manner.

Good resource management decisions should be based on a balanced assessment of both positive and negative impacts. We are concerned that, in an attempt to be thorough in describing potential impacts, the DEIS has a distinct negative tone. The issues and impacts discussed in this DEIS should be stated clearly and without speculative language. Many of the issues and concerns are highly sensitive both publicly and politically. The language of the FEIS should be designed to provide the public with an objective analysis of the proposed lease sale. This can lead to an informed opinion regarding the acceptability of risks, rather than heighten anxiety. The validity or realism of the potential impact being described should be verified by research conclusions or actual occurrence of the impact under similar circumstances. Failing such a test, the issue in question should receive little or no attention in the final environmental impact statement.

During the scoping period we advised you of two major concerns which we still have. These are:

1. Seasonal Drilling Restrictions.
2. Flexibility in prescribing certain activities associated with energy resource development.

In our letter of March 24, 1982, we outlined Exxon's position on these two issues. The draft environmental impact statement is believed to be unduly restrictive in the following respects:

A DIVISION OF EXXON CORPORATION

Response to EXXON's Comments

1. The BLM agrees that use of a single EIS to consider all sales on the NPR-A and to recommend a preferred leasing program is in the total public interest.
2. The Final EIS provides the public with an objective analysis of alternate leasing programs.

December 9, 1982

• We continue to oppose any type of seasonal drilling restriction. The existing regulations and lease stipulations of the previous NPR-A sales are more than adequate to protect biological resources of the NPR-A and allow the subsistence activities to continue. We strongly object to the additional proposed lease stipulations adopted during the scoping period and included in this DEIS for future sales. It is particularly unnecessary to require a lease stipulation concerning threatened/endangered plants when we have found no discussion of threatened/endangered plants in the text of this DEIS.

• We believe that it is unnecessary to delete from leasing any part of the NPR-A because of speculative impacts on calving and migration of caribou. As we have described in previous comments to you, the Central Arctic Herd, with its calving grounds and primary summer range in the vicinity of Prudhoe Bay, the largest oil field in North America, actually increased in population from about 5,000 at the time of the 1968 oil discovery to 6,700 in 1979. Furthermore, even in the field proper there has been little, if any, change in the use that caribou have made of the area. We also feel that discussion of the possible effects of road and pipeline construction on caribou migration is misleading in that no reference is made to the known negligible effects of the Trans-Alaska Pipeline System and North Slope Haul Road.

• Failure to offer for leasing areas where Black Brant molting occurs is inappropriate and unnecessarily restrictive. A wildlife study conducted at Exxon's Point Thomson #4 drillsite in the summer of 1980 indicated that the drilling facilities actually created habitat for a number of bird species and caused negligible interruption of normal wildlife activities. Existing state and federal regulations adequately protect wildlife throughout the NPR-A. Exxon encourages and supports any effort of BLM to lease all of the acreage evaluated in this DEIS.

Exxon Company, U.S.A. strongly supports an active schedule for leasing of land in the NPR-A. We believe that the exploration and production operations on the North Slope, conducted since 1944, give no indication that these activities have had any significant adverse effect on the region's wildlife or the lifestyle of the North Slope natives.

We appreciate the opportunity to provide our comments and we hope that they will be helpful in preparing the final environmental impact statement for the NPR-A leasing program. We will be glad to discuss our comments with you or provide any other assistance you may require.

Sincerely,



EDS:DLM:wb

3.

3. The Final EIS treatment of threatened and endangered plants in Chapter One, p. 1, and the seasonal restrictions included in the Preferred Alternative, p. 126, (Chapter Five) respond to your comments.

4.

4. The BLM is aware of Central Arctic Herd studies and has used their observations and conclusions as a rationale to support the minimal deletions recommended by the Preferred Alternative (see Plate One, last page). However, as you have pointed out, the Central Arctic Herd has its calving grounds "in the vicinity of Prudhoe Bay" not within the area of industrial activities. The authors of the reports on the Central Arctic Herd that you cite were members of the Caribou Discussion Panel (Gilliam and Lent, 1982). This Final EIS and the Preferred Alternative, p. 126, are in keeping with the Panel's recommendations and impact analyses.

5.

5. The Preferred Alternative, p. 126, in Chapter Five includes provisions for the restoration of deleted lands to the leasing program if it can be shown that current studies show a high degree of compatibility of molting black brant with petroleum activities. If compatibility is demonstrated in Exxon's Point Thomson #4 wildlife study or any other study, then the BLM would be interested in reviewing such studies.

6.

6. The BLM believes the Final EIS Preferred Alternative, p. 126, in Chapter Five supports an active schedule for leasing in NPR-A as envisioned by P.L. 96-514.



Alaska Center for the Environment  
1069 W. 6th Avenue  
Anchorage, Alaska 99501 274-3621

December 10, 1982

ANCHORAGE AK

DEC 13 1 45 PM '82

MAIL ROOM

Jerry C. Wickstrom  
Bureau of Land Management  
NPR-A (916)  
701 C Street, Box 13  
Anchorage, AK 99513

Dear Mr. Wickstrom:

Upon review of the Draft Environmental Impact Statement on Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska (DEIS), it becomes apparent that one particular area, the Colville River, did not receive proper attention. Although it is admirable that BLM recognizes the uniqueness and value of the Colville River for its wildness and the biological significance of its raptor resource, the provisions for the protection and management are inadequate. The Secretary of Interior recognizes the unique value of the Colville area when he designated it one of the few "special areas" within NPR-A as authorized under the Naval Petroleum Reserve Production Act of 1976. This designation of "special" carries with it a call for "extraordinary protection of surface values within them" (p.5, DEIS). The BLM staff in its earlier environmental assessment recognized the nesting population of raptors along the Colville River as a raptor resource of world class proportions. It is truly a unique density of nesting arctic raptors. Although BLM seems to recognize the value of the resource it seems to be heading toward a piecemeal approach for its management which provides little protection from the effects of oil and gas development, and has no long range objectives.

The two forms of protection for these birds mentioned in the DEIS both have questionable futures and certainly do not lend themselves to long range management. The withdrawal of the Colville and some of its tributaries from oil and gas leasing in order to provide Congress with time to determine whether they should be permanently designated as wild and scenic, is only a temporary measure. While it is true it provides the birds immediate protection to some degree, it expires in September of 1984 and can not realistically be counted on to protect the resource. The lease stipulations listed on Plate 9 (DEIS) are the heart of the protection being considered, and they also fall short of what is needed. They are based on guidelines developed by the Office of Endangered Species (ODES) and must also be considered temporary. They are only in place as long as the tundra peregrine remains a listed species. As the population recovers, pressure will increase to de-list them. There is already an effort being mounted in the Washington office to down list the tundra subspecies of peregrine. These stipulations could evaporate at some future date.

Response to Alaska Center for the Environment's Comments

The Final EIS Preferred Alternative, p. 126, in Chapter Five and Plate One, last page, recommends adequate conservation and management provisions for the Colville River with respect to P.L. 96-514 through its Special Management Zone (SMZ) recommendation. The latter uses current information to refocus the intent of "special area" designations of the Naval Petroleum Reserves Production Act (NPRPA) while preserving the Congress's right to provide stricter controls for wild and scenic river designations. NPRPA "special areas" only call for extraordinary protections and does not exclude oil and gas activities. This approach cannot be considered piecemeal with respect to the effects of oil and gas development.

According to the Endangered Species Acts, the BLM cannot allow oil and gas activities to adversely affect the endangered peregrine, regardless of any wild and scenic river designations. The special lease stipulations that BLM will enforce were worked out in consultation with the U.S. Fish and Wildlife Service. If the peregrine falcon is removed from the Endangered Species List, we would review this stipulation for possible modification or deletion. More general multiple use management concepts which seek to conserve all uses of the land including peregrine falcon use, other raptor use, scenic values, oil and gas production, etc. could be substituted. The BLM intends to treat every area suitable for peregrine falcon nesting on NPR-A as potential nesting sites and will protect them throughout the permitting process. The BLM will continue to monitor and report on population status. However, the BLM cannot make any stipulation that would endanger human life or safe flying practices. It is recognized that there may be some indirect effects on the peregrine falcon from oil and gas activities. The BLM will attempt to reduce these effects in the permitting process which includes further NEPA compliance requirements and cooperation and consultation with the State of Alaska, the North Slope Borough and the public, as appropriate. The petroleum industry, already "painfully aware" of the need to protect peregrine falcons, has agreed to work with the BLM toward reasonable protections.

In our effort to provide effective stewardship of NPR-A, the BLM acknowledges the values, regulations and responsibilities you have mentioned.

The focus should be on protection of the resource through proper management instead of the incidental protection proposed. This density of nesting arctic raptors is unique on the world wide scale and should be managed as such. There are several shortcomings with the stipulations from Plate 9 (DEIS).

1. The 1 mile radius circle around active and historic peregrine nests does not account for new nests which should result from this recovering peregrine population. It gives no protection to the cliffs needed by this increasing population.
2. All sites may not be known from year to year.
3. It is unclear what happens to a historic nests protection if it is subsequently found unoccupied.
4. It gives only incidental protection to raptors other than peregrines and excludes a major portion of them.
5. The exceptions made for aircraft in inclement weather allows violation at the most critical time for the birds. Inclement weather is the most dangerous time for them to leave the nest.
6. They do little to protect the birds from the indirect effects from development.

There is concern that the stated effect of Standard Requirements Leasing on peregrine falcons will actually occur. The stated effects of standard requirements leasing would "eliminate the impacts of oil development on peregrine falcon and reduce impacts to other raptors by assuring that no activities or facilities would be within one mile of peregrine falcon nest sites and by strictly controlling habitat alteration in areas peregrines use for hunting." (p.64, DEIS) This can be achieved only if all nest sites are known on a yearly basis and there is no guarantee that an annual survey will be performed.

There is also concern that the leasee will be able to skirt what should be their responsibility for employee actions if BLM actually takes the position stated on p.87 of the DEIS, "impacts on peregrines thus are not resolveable through stipulations aimed at leasee's activities." Any violation of restrictions at nest sites by employees of the leasee must be treated as a direct effect of oil and gas development on the peregrine falcon, even if it occurs during their recreational time. Stipulations should be clear in this regard and penalties for violation severe enough to assure they will not occur.

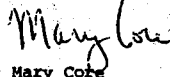
It should be assumed that seasonal restrictions will necessarily give the needed protection to other raptors. Their nesting cycles do not coincide. For example gyrfalcons are on the territory and nest well before peregrines.

Both the wilderness values and raptor resource of the Colville River area, including tributaries especially the unmentioned Kogosukruk River, are extremely fragile. Their protection is worthy of much more consideration than they are given in the DEIS. The Colville has been recognized as a "special" area and should receive at least the same careful consideration given the Utokok River and Teshekpuk Lake goose molting area.

(3)

Management for this fragile resource should be more comprehensive and long range with a serious emphasis placed on its protection. As was pointed out on page 5 of the DEIS, the Federal Lands Policy and Management Act "firmly established the principle of multiple use management" and instructs BLM to manage "the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people....with consideration being given to the relative value of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output." It is felt that BLM has not adequately considered the Colville River Area or properly weighed the relative value of the area.

Sincerely,



Mary Cole  
Executive Director

MC/bb



US Department  
of Transportation  
Federal Aviation  
Administration

Alaska Region

701 C Street, Box 13  
Anchorage, Alaska  
99513

Received 1/7/83  
NPR-A (916)

**JAN 04 1983**

Mr. Curtis McVee  
Bureau of Land Management  
Alaska State Office  
701 C Street, Box 13  
Anchorage, Alaska 99513

Dear Mr. McVee:

This is in response to your letter of October 13, 1982,  
concerning the draft environmental impact statement for  
leasing in the National Petroleum Reserve - Alaska (NPR-A).

As previously discussed with Mr. Jerry Wickstrom, Program  
Manager for NPR-A, the Federal Aviation Administration has no  
means of establishing regulatory constraints or restricting  
airspace over affected habitat areas. It is possible to have  
critical nesting areas depicted on sectional aeronautical  
charts as was done for the Prudhoe Bay and Alaska  
Pipeline/Haul Road development.

Any further pilot education would be the responsibility of the  
lessor and/or lessee.

Thank you for the opportunity to comment.

Sincerely,

A. B. Bruck  
Manager, Airway Facilities  
Division

ANCHORAGE, ALASKA

JAN 6 1 20 PM '83

BUREAU  
MAIL

Response to FAA's Comments

Thank you for your response.



ARCO Alaska, Inc.  
ARCO Exploration - Alaska Operations  
Post Office Box 380  
Anchorage, Alaska 99510  
Telephone 907 265 8515

G. T. Wilkinson  
Executive Vice President

December 10, 1982

Mr. Jerry Wickstrom  
NPR-A Program Manager  
Alaska State Office  
NPR-A (916)  
701 C Street, Box 13  
Anchorage, AK 99513

Dear Mr. Wickstrom:

RE: NPR-A Draft Environmental Impact Statement

ARCO Alaska, Inc. appreciates this opportunity to comment on the October 1982 National Petroleum Reserve-Alaska (NPR-A) Draft Environmental Impact Statement (DEIS).

After review of this document ARCO Alaska, Inc. has the following comments for your consideration. In general, the alternatives, as proposed, stifle the continuity of the overall NPR-A leasing strategies. We would like to recommend a deferral, rather than deletion, of tracts to minimize stop/start leasing. This deferral option would lend itself to a program of continuous leasing in the future, aiding industry planning for the NPR-A lease process.

Another concern is the "worst case" scenario which tends to approximate a 50% mortality of the caribou herd. We feel this scenario is unrealistic and unfounded and will have the effect of arousing the native population to be totally antagonistic to oil and gas leasing in the NPR-A. We recognize that impacts may occur but they will generally be of a site specific nature. A study, "The Kuparuk Oil Field Ecosystem - a literature summary and syntheses and an analyses of Impact Research" (enclosed), was performed and the results indicate, to date, development has not influenced herd recruitment or population despite some affect on herd behavior.

Finally your discussion, page 58, on minimum requirements indicate "other permits". We feel a classification is necessary so these "other permits" can be readily identified. The "other permits" should be directly related to drilling activities. A list of the types of "other permits" should be

1.

1. The BLM's point is that adoption of the Final EIS Preferred Alternative, p. 126, in Chapter Five would "minimize stop/start leasing." The petroleum industry will be given the opportunity to participate in the sale area selection process in conjunction with the State of Alaska, North Slope Borough and information provided from the public. Additional nomination processes are an optional component.

2.

2. The BLM wishes to thank ARCO for the Truett, Howard and Johnson (1982) report which was unavailable during Draft EIS preparation. This document was used to revise the Chapter Four, p. 79, comprehensive analyses. The BLM has not found, "the Native population to be totally antagonistic" to reasonable methods of oil and gas leasing in the NPR-A. While the residents of NPR-A cannot be termed enthusiastic about potential developments, they and, in particular the North Slope Borough, have been assured by the BLM that their opinions will be solicited and considered in the management of the NPR-A.

3.

3. This Draft EIS discussion has been revised in Chapter Three, p. 55, of the Final EIS. With incorporation of the former Minerals Management Service authorities into the BLM, the term "other permits" has been changed to "any permit" in the model biological conservation stipulation to reflect BLM directives that permitting decisions be based on adequate information. However, you are correct in assuming that the level of detail required for a geophysical permit not expected to result in significant impacts will differ from the level of detail required for a permanent cross-country road or pipeline.

included in the DEIS. In addition, there should be an exclusion from this list of geological or geophysical permits, since these activities have an insignificant impact on the environment.

We thank you for this opportunity to comment on this very important NPR-A DEIS.

Sincerely,

*G. T. Wilkinson*  
G. T. Wilkinson

GTW/RO/nrt

Enclosure

Received 12/14/82  
NPR-A m713

# Trustees for ALASKA

833 Gambell Street, Suite B • Anchorage, Alaska 99501 • (907) 276-4244

December 10, 1982

Mr. Jerry Wickstrom  
Program Manager, NPRA  
Bureau of Land Management  
Alaska State Office  
701 C Street  
Anchorage, AK 99513

Dear Mr. Wickstrom:

Thank you for this opportunity to comment on the Draft Environmental Impact Statement (DEIS) for oil and gas leasing in the Naval Petroleum Reserve-Alaska (NPRA). These comments are being submitted on behalf of Trustees for Alaska, a non-profit public interest environmental law firm whose purpose is to provide legal counsel to concerned groups and individuals in the state of Alaska, so as to avoid unreasonable and arbitrary exploitation of Alaska's natural resources.

We appreciate BLM's desire to keep the DEIS to a manageable length, and to avoid unnecessary restatements of earlier reports. We also sympathize with BLM's hope not to have to write EIS's for individual lease sales, and to fulfill Congress' desire for "an expeditious program of competitive leasing of oil and gas" in the NPRA. P.L. 96-514. But we believe that given the importance of the biological and subsistence resources of the NPRA, this DEIS must be greatly revised and submitted again for public comment.

As the DEIS itself recognizes, the NPRA is a vital habitat for wildlife and waterfowl. It is the home and calving grounds of three of the four caribou herds in the state, and contains the nesting habitat for peregrine falcon and the molting habitat for black brant and other waterfowl. Grizzly bear and polar bear prowl the area, along with fox, wolverine and other predators. A variety of raptors inhabit the Colville River area. And of course, the NPRA contains the highly scenic Brooks Range.

While Congress recognized the need for expeditious leasing in the NPRA, it also intended that these important wildlife resources, and the subsistence lifestyle that is founded upon them, be adequately protected. Thus, in P.L. 96-514, Congress provided that "activities undertaken pursuant to this Act shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources" of the NPRA. And in P.L. 94-258, the Act transferring authority over the NPRA to the Secretary of the Interior, Congress made it plain that it expected the Secretary to "take every precaution to avoid unnecessary surface damage

## Response to Trustees for Alaska's Comments

1. The BLM has, in the Preferred Alternative, p. 126, in Chapter Five recommended reasonable conservation measures protecting biological and subsistence resources for an NPR-A leasing program that is totally in keeping with both NEPA and P.L. 96-514 directives.

2. Adoption of a leasing program similar to the Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) would be consistent with both P.L. 96-514 and P.L. 94-258 Congressional directives. The BLM has provided recommendations that will adequately conserve important wildlife resources and the subsistence lifestyle that is founded upon them.

and to minimize ecological disturbances throughout the reserve."  
H.Rep. 94-192, 94th Cong., 2d Sess., at 21.

Areas of special biological sensitivity were of particular concern to Congress. In these areas, "including specifically the Utukok River area and the Teshekpuk Lake area," the Secretary must require that "exploration operations . . . be conducted in a manner which will minimize the adverse impact on the environment." *Id.* Given its vastly greater impacts, the same must be true of production. 3.

An Environmental Impact Statement is meant to be an integral part of the planning process. 40 CFR 1500, 1501. It must lay out real alternative strategies and evaluate the environmental impacts of each. 40 CFR 1502.14. Given the vital biological and subsistence resources involved in the NPRA, and Congress' deep concern about them, this DEIS must be particularly careful in its choice and evaluation of alternatives.

We believe, however, that this DEIS does not suffice as a planning document for leasing in the NPRA. The DEIS is not presented in a form that permits evaluation of impacts from an oil and gas leasing program; it cannot serve as the EIS for individual lease sales; it lacks an analysis of key cumulative impacts and is deficient in its evaluation of biologically sensitive areas; it relies to some extent on insufficient or inaccurate data; and the "preferred alternative" contains several flaws. We address each of these points below.

I. The DEIS Is Not Presented in a Form that Permits the Public to Evaluate a Leasing Program's Impacts

The DEIS basically is a discussion of the impacts of oil and gas production across the entire NPRA, with suggestions for mitigating those impacts. The DEIS neither provides nor discusses an actual leasing program-- the program apparently is being developed independently. Rather, the entire discussion is abstract, relying at times upon hypothetical development scenarios that the DEIS admits are just that: hypothetical. 4.

This approach makes it very difficult to analyze the DEIS. There are a number of holes. First, the DEIS does not identify in the text the areas of high, medium, or low hydrocarbon potential, nor does it analyze the biological or subsistence resources of those individual areas. The DEIS fails to identify which areas BLM intends to offer for leasing-- or even those which have already been leased. In fact, it does not even explain the basis for its goal of leasing 12 million acres, much less identify those acres or analyze the impacts of offering that much acreage (as opposed to some other amount). Finally, and perhaps most important, the DEIS does not describe the leasing procedure it intends to use, nor does it set out a schedule for leasing showing the timing and location of sales. All of these things are

3. This Final EIS presents alternative leasing strategies and alternative leasing programs consistent with both NEPA and P.L. 96-514 directives.

4. The Final EIS has a new format to more clearly respond to your concerns. It provides and discusses three possible choices for a leasing program. The hypothetical development scenarios are based on examples of similar Arctic development whenever possible. They are not intended to be considered for any purpose other than to illustrate events that are likely to accompany oil development in the relatively uninhabited regions of NPR-A. We feel that they should not be considered "improper" just because they are hypothetical.

Figure 2, p. 9, (Plate 2 in the Draft EIS) displays the best available information on petroleum potential. Plate One, last page, clearly identifies areas to be offered and areas already leased. As explained in the Final EIS, the BLM expects to offer 12 million acres to expose the high potential oil and gas lands in NPR-A. The recommended Preferred Alternative, p. 126, in Chapter Five describes the leasing procedures, sale schedules and location of sales.

The Final EIS considers both alternative leasing strategies and alternative leasing programs. The alternative leasing program which meets the requirements of P.L. 96-514 provides an analysis in which standard stipulations and deletions are reduced or eliminated. The Preferred Alternative, p. 126, is not the only choice offered in the Final EIS.

Wickstrom  
12/10/82  
Page 3

central components of a leasing program; since the DEIS is supposed to be about that program, it is difficult to understand why the DEIS does not even mention them, much less analyze them.

This problem is compounded by the nature of the "alternatives" analyzed by the DEIS. These are not real alternatives. Rather, they are components of any intelligent overall leasing strategy, since they involve use of standard and site-specific stipulations, as well as deferrals and deletions of particular areas. No one could seriously argue that standard stipulations or deletions of lease tracts alone would suffice to protect the NPRA. In this sense, the "preferred" alternative, being a combination of alternatives, is the only possible solution, given the choices offered by the DEIS.

This suggests that the DEIS went about its choice of alternatives incorrectly. An EIS is supposed to be an analysis of a program, which implies that the alternatives must be stated in terms of which areas should be leased, and when they should be leased. Such an approach would mean that the DEIS would analyze the NPRA according to regions within the NPRA, evaluating these regions in terms of their hydrocarbon potential and biological and subsistence importance. Stipulations could then be presented in the context of this analysis, enabling the planner and the public to evaluate their efficacy in a real, as opposed to the DEIS's abstract, context.

At the hearing in Anchorage, BLM representatives explained that they rejected this approach apparently because BLM believes that decisions about the timing and location of lease sales are independent of evaluations of the environmental impact of oil and gas leasing in the NPRA. This makes no sense. For one thing, the DEIS itself recommends that certain areas be deleted or deferred, which obviously concerns timing and location of sales. More important, one schedule of lease sales may have very different site-specific and cumulative impacts than another schedule. For example, scientists do not fully understand why caribou choose the calving areas they do or whether caribou habituate to development. Lease sales could be located and timed to provide more data on these problems, avoiding development in more critical areas until more is known. The same approach could be important to gather vital data on polar bear denning behavior.

For these reasons, we believe that the DEIS must present and analyze different 5-year strategies for oil and gas development in the NPRA. To choose instead the vague course adopted by the DEIS is neither to adequately analyze the impacts of leasing in the NPRA nor to comply with NEPA.

## II. An EIS Will Be Needed for Individual Lease Sales

Because of the deficiencies discussed above, the DEIS does not adequately address the environmental impacts of individual lease sales. It can hardly do so, since it does not analyze the impacts on a

We hope that the Final EIS presents proper alternatives in a more understandable format than did the Draft EIS. P.L. 96-514 directs that any leasing program will lease expeditiously, and the BLM feels that the real alternatives exist in choices of where not to lease and how to lease. P.L. 96-514 does not ask for a "regional" approach, as you suggest, nor is such an approach required under NEPA. Your suggestion would reduce the significance of the total program that BLM is presenting to the public. Under the Preferred Alternative, p. 126, the scheduling of at least the first five lease sales is established. However, tracts to be offered will emerge from the sale area selection process preceding each sale. This will determine if each sale offering represents the best balance of P.L. 96-514 directives: to encourage petroleum development while providing reasonable mitigations for likely impacts.

In summary, the BLM will notify the public and industry of general potential sale areas at least fourteen months in advance. These areas will be delineated into tracts based on technical geologic and administration criteria. Lease stipulations, selected from the EIS models, will be assigned to each tract. The sale tracts with attached stipulations will be reviewed with the State and North Slope Borough and analyzed for compliance with the State of Alaska Coastal Zone Program. Tracts, legal descriptions, and stipulations will be published in a Sale Notice in the Federal Register. As stated in Chapter Five, p. 121, the intent is that tract deletion be a function of the EIS and future decisions or tracts will be restricted to stipulations, boundaries and/or year of offer.

The projected exploration and discovery rate and the development potential of the NPR-A indicates that there is little environmental difference between a rapid or slow leasing process. The phased leasing approach cannot be justified in light of satisfying the national objective to expedite oil discovery and production.

5. The BLM agrees that this Final EIS is a programmatic EIS which considers all significant issues prior to the implementation of a leasing program under P.L. 96-514. It analyzes anticipated impacts of all sales in one document in

region-by-region basis, nor does it address the cumulative impacts of leasing. And even if it were to follow the approach outlined above, individual EIS's, or at least environmental assessments, must be prepared for each lease sale.

NEPA requires that federal projects be analyzed on a case-by-case basis to determine if they are "major" and have a "significant impact" upon the environment. At best, this DEIS is programmatic--it cannot evaluate the impacts of individual sales, if only because as each sale is held, the context of the next is affected, and the environmental impacts may change. As such, individual lease sales must be analyzed to comply with NEPA, a result which in any event makes good sense as a policy matter, since this is the best means by which the impacts of the activities resulting from sales can be measured and mitigated.

### III. The DEIS's Environmental Analysis Is Insufficient

The DEIS contains a number of holes which render its analysis deficient. First of all, as noted above, the DEIS fails to analyze the environmental effects of (or even to justify) the stated goal of leasing 12 million acres of the NPRA over the next five years. Similarly, the DEIS does not analyze the effects of any schedule of the timing and location of sales. 6.

Second, the DEIS does not really discuss, much less explain or justify, its conclusion that there will be no "medium" or "major" oil spills in the NPRA (p. 53). This frankly is difficult to believe, particularly since "medium" discharges have apparently occurred in the Prudhoe Bay area, and there was a quite large spill in the much more favorable climate in Wyoming this past summer.

Relatedly, the DEIS does not really analyze the effects of an oil spill upon the wildlife or its habitat. Most of the environmental analysis concerns the effects of the oil and gas activity itself upon the wildlife, not the impacts of an oil spill. This is a particular problem, of course, with regard to major spills, but given the DEIS's conclusion that there will be spills in the NPRA, some of which will occur in wetlands, more attention must be devoted to the effects of those spills. In addition, chronic low level pollution from small spills and discharge of drilling muds must be analyzed.

Third, the table on p. 9 (I-2) contains several shortcomings. Fox, for example, may well be fed by the workers, which can have real impacts, since the feeding can alter their behavior, increase fox populations above carrying capacity, etc. Furthermore, the table fails to address the effects upon several species. For example, moose inhabit large portions of the Colville River area; the DEIS must analyze the impacts of development upon moose and potential mitigation measures. Other important species include the spotted seals along the coast of the Chukchi Sea, belukha whales, and the endangered bowhead whale, which pass fairly close to the coast off the NPRA.

keeping with NEPA requirements (40 CFR 1502.4(a)). Requiring individual EISs for each sale would be redundant, could mislead the public on the total significance of all the sales and would violate NEPA directives (40 CFR 1508.27(b)(7)) prohibiting the avoidance of the significance of an action by breaking it down into smaller parts.

6. As explained in response #4 the "goal" of 12 million acres to be offered for lease represents BLM's best guess of the amount that would have to be offered in order to lease the high potential lands. The Final EIS considers three alternative leasing programs with different schedules. Since any program would include reofferings, the actual rate of exploration and any development of NPR-A would probably be similar despite any sale schedule differences given the directive in P.L. 96-514 to lease expeditiously.

The Oil Spills Risk and Response Analysis has been rewritten in the Final EIS (see Chapter Five, p. 121) in response to this and other comments.

Draft EIS Table I-3 was replaced with the actual subjective findings of the scoping process preceding this EIS. None of the species you mention were found to be significant issues in this scoping process conducted under NEPA guidance (40 CFR 1501.7).

The comprehensive analyses in the Final EIS are based as much as possible on the literature and analogous examples from other Arctic areas. The BLM has publicly acknowledged the limits of baseline data. Simplifying assumptions were used to bridge data gaps in these "worst case" analyses. To protect polar bears, any permits issued would carry site-specific stipulations such as those on Figure 20, p. 81, and site-specific investigations would be required before issuing a permit.

This EIS considers possible effects on and adjacent to the NPR-A. Although it is beyond the scope of this EIS, a model of concurrent Arctic development was added to Chapter Five, p. 121.

This EIS process considered the effects of all lease sales and the total likely level of development. It goes beyond the effects of individual lease sales because they could be considered as insignificant parts of the whole program. The major flaw in your suggestion is that it implies that the leasing of any tract means that it will be affected despite analyses of likely types and levels of development to the contrary.

Wickstrom  
12/10/82  
Page 5

Fourth, we have doubts about the adequacy of the comprehensive analyses, as they appear to be based upon a number of unsupported assumptions and insufficient data. For example, we find it hard to believe that the molting habitat of geese is necessarily at carrying capacity (p. 82), and the analysis of grizzly bear density appears oversimplified. In addition, the DEIS presents an "analysis" of the effects of oil and gas activity on polar bears, even though it admits that "[w]ithout better baseline data to estimate from, the amount of [population productivity] reduction and its significance is unclear." (p. 80) Under these circumstances, we believe that it is inappropriate for the DEIS to recommend development in polar bear denning areas when BLM is unsure what that activity may actually do.

Finally, the DEIS's analysis of cumulative impacts is inadequate. It does not evaluate the effects of NPRA leasing in conjunction with other oil and gas activity on the North Slope. For example, if caribou are being displaced westward from Prudhoe Bay and the Kuparuk field, would NPRA activity squeeze them from the west? The DEIS does not address this issue-- it merely mentions (p. 52) that there is other oil and gas activity on the North Slope.

Similarly, the DEIS fails to focus upon the cumulative effects of individual lease sales. Lacking any identification of areas to be leased, and the timing of leasing, makes such an analysis quite difficult, but it still must be done. For example, the caribou and waterfowl move around a lot in the NPRA-- how will the timing and location of sales and their concomitant activity affect them? Could there be a problem of reduction of bear or caribou habitat over time? What are the ramifications of a slow but steady increase in the amount of dredged and filled wetlands? What about the effects of piecemeal pipeline construction like that in the Kuparuk area? Questions like these must be addressed if the EIS is to be adequate.

#### IV. The "Preferred Alternative" Does Not Adequately Protect the NPRA's Resources

We have a number of problems with the preferred alternative. First, and most important, the preferred alternative does not adequately protect the biologically sensitive areas of the NPRA. The areas proposed for deletion should be enlarged-- and withdrawn for all time. The Utukok area is a critical calving area for the Western Arctic Herd, and it must be completely protected to assure continuity of the herd. In addition, the area proposed for deletion is too small. The data relied upon by the DEIS relate to a period when the herd was at an all-time low; more recent data indicate that the "core area" is much larger than that identified by the DEIS. Moreover, the calving area moves around from year to year, and the area withdrawn by BLM must reflect this fact by providing some kind of buffer zone. It should also be noted that this will have the ancillary effect of mitigating impacts upon the grizzly bear.

7.

7. The BLM believes the Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) recommends adequate conservation measures for a leasing program responsive to P.L. 96-514 directives. Potential endangered peregrine falcon nesting sites will be appropriately protected in any permitting action. At present, gravel mining in the Colville River is restricted because of the wild and scenic study river status. Each gravel extraction operation on Federal lands is examined on an individual basis so that appropriate site-specific mitigating measures can be developed.

The lagoons on the Chukchi Sea are not within the NPR-A. They are encompassed by the Alaska Maritime National Wildlife Refuge and presently cannot be leased under NPR-A authorities.

We also believe that the area proposed for deletion in the Teshekpuk Lake area must be enlarged. The DEIS simply assumes that by protecting black brant molting habitat, the calving grounds of the Teshekpuk Lake caribou herd will also be protected. This may not be the case. Moreover, the Teshekpuk Lake area is an extremely rich and diverse ecosystem that is very important to subsistence activities. For these reasons, the entire Teshekpuk Lake area should be withdrawn from leasing.

The Colville River area is also deserving of greater protection. The Colville and nearby rivers are important habitat not only for peregrine falcons, but for other raptors and moose. The DEIS seems to accept unfortunate impacts upon non-endangered raptors; it should not do so. Moreover, protection should be afforded to potential peregrine falcon nesting sites, not just actual or historical ones. This will also help protect other raptors and perhaps moose. We also are quite concerned about the effects of gravel mining in the Colville-- these need to be addressed in more detail, and appropriate mitigating measures evaluated.

We further recommend large-scale deferral, and seasonal no occupancy restrictions upon, the lagoons along the Chukchi Sea, so as to best protect waterfowl, seals, and whales.

Finally, we have some specific comments upon the preferred alternative itself:

1. We agree that each area to be leased must be analyzed, but that analysis should occur both prior to the lease sale and again when the lessee is developing its plans for drilling. Relatedly, the identification of "notable" biological resources should be made sufficiently in advance to determine whether an EIS is needed, and to develop and make available for public comment any necessary individual stipulations.
2. The case-by-case approach makes it difficult to determine the cumulative impacts of different sales.
3. BLM should include in its preferred alternative a schedule setting forth the timing and location of sales.

#### V. Other Comments

1. Maps with overleafs to allow comparison of oil and gas potential with biological resources would be very helpful in analyzing the impacts of different leasing alternatives.
2. The section on relevant laws should discuss the Endangered Species Act and the Wild and Scenic Rivers Act.
3. While we recognize the difficulty of analyzing the "affected environment" (p. 15), we believe that a focus on regional impacts could help.

8. The Final EIS Preferred Alternative, p. 126, in Chapter Five recommends that each tract in the sale area selection process be analyzed for inclusion of appropriate stipulations and that each permit application for activities on the lease be considered in a NEPA compliance procedure.

9. It is unclear what is meant by the "case-by-case approach". This Final EIS considers the possible effects of all sales not just one sale.

10. The Final EIS Preferred Alternative, p. 126, (see Chapter Five) recommends a sale schedule. All sales will be held in Anchorage and will offer tracts from those portions of NPR-A open to lease tract selection under the adopted leasing program. Geographic location of tracts to be offered within the Reserve is a function of the sale area selection process and described in response #4.

11. The BLM agrees that the use of maps to present leasing program alternatives in the Draft EIS was confusing. The Final EIS concentrates on narrative descriptions.

12. Relevant discussions of the Endangered Species Act and the Wild and Scenic Rivers Act have been incorporated at several points in the Final EIS.

13. The comprehensive analyses present this "regional" approach (see Chapter Four, p. 79) by analyzing hypothetical developments in the various ecosystems.



Wickstrom  
12/10/82  
Page 7

4. We had a great deal of difficulty understanding what "no surface occupancy" means-- often, it sounded like some occupancy was allowed at some time of the year. Could this not lead to a permanent presence over time? Relatedly, it is hard to see how a no surface occupancy clause can actually harm wildlife (pp. 64-65); at worst, it would appear to be irrelevant.

We hope that these comments are of use to you. Again, we urge you to redo and reissue this DEIS for further public comment, using an actual leasing schedule, in order to make this the adequate planning document contemplated by NEPA.

Sincerely,

*Eric Smith*

Eric Smith  
Executive Director

14.

14. Chapter Four, p. 79, has been rewritten to clear up possible misunderstandings. A clear definition of the use of surface occupancy restrictions has been provided.



United States Department of the Interior

BUREAU OF MINES

ALASKA FIELD OPERATIONS CENTER

P.O. BOX 550  
Juneau AK 99802

December 6, 1982

MEMORANDUM

TO: NPR-A Program Manager (916)  
Alaska State Office  
Bureau of Land Management  
701 C Street, Box 13  
Anchorage, AK 99513

FROM: Chief, Alaska Field Operations Center

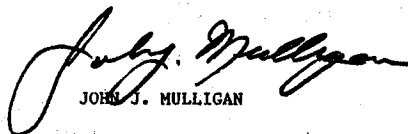
SUBJECT: Draft Environmental Impact Statement on the Proposed Oil and Gas Leasing and Development Program in the National Petroleum Reserve in Alaska (NPR-A)

Response to Bureau of Mines' Comments

Thank you for your review and insights.

This draft addresses the impact of proposed oil and gas leasing on local cultural and biological resources. The abundant coal and hard mineral resources in NPR-A are not considered. If leasing does occur, and particularly if valuable discoveries result, it almost certainly will tend to enhance the value of these minerals through improved access. However, it probably is premature to consider the possible impacts on coal and hard mineral resources at this stage because it is not possible to predict where leasing or discoveries may occur. In any case the development of coal or hard minerals will require a separate EIS.

The Bureau of Mines, Alaska Field Operations Center, can furnish a summary of the present knowledge of mineral deposits and estimates of mineral potential if it is desired to include such data in this EIS.

  
JOHN J. MULLIGAN

cc: B. Goodwin (2), BOM WO  
File: ENV-2, NPR-A

SOHIO

Received  
12/10/82  
NRC - letter re specific  
Comments line #125,  
1st 2 lines, appears to  
be page(s) missing.  
JCV

December 10, 1982

Mr. J. C. Wickstrom  
NPR-A Program Manager  
Bureau of Land Management  
Alaska State Office  
NPR-A (916)  
701 C Street, Box 13  
Anchorage, Alaska 99513

Dear Mr. Wickstrom:

Sohio Alaska Petroleum Company is an experienced operator in the Alaskan Arctic, onshore as well as offshore in the Beaufort Sea. The technical expertise we have gained as operator of the Western Operating area of Prudhoe Bay Field is extensive and has been applied to all our exploration operations. Starting in the 1960's Sohio has safely drilled exploratory and development wells in the arctic. We therefore feel especially qualified to comment on the NPR-A Draft Environmental Impact Statement (DEIS).

In 1981, the Department of Interior Appropriations Act was passed becoming Public Law 96-514. This law mandated an expeditious program of oil and gas leasing in the NPR-A. It also mandated that restrictions and prohibitions be applied to activities as "necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources" of NPR-A. It did not mandate that there be no impact to surface resources; and it certainly did not intend for the protective measures to be so extensive and restrictive that the operational constraints and economics of oil and gas exploration become prohibitive. The mitigating measures in the preferred leasing alternative proposed by the Bureau of Land Management (BLM) in this DEIS are excessive. We object most seriously to the "design solution leasing", the seasonal drilling restrictions and the no surface occupancy restrictions. They go beyond the intent of PL 96-514 in an effort to protect surface resources; and they are too nonspecific with respect to significant restrictions that must be clarified prior to a lease sale. The biological and cumulative impact analyses used to justify these mitigating measures are exaggerated, often unsubstantiated and often fail to evaluate recent information.

The major problem with Design Solution Leasing is the fact that mitigating measures will not be known at the time of a lease sale but will instead be applied at the permit level. The design leasing solution places the burden on the applicant to provide all of the biological baseline data and maps

Response to SOHIO Comments

1.

1. The Final EIS Preferred Alternative, p. 126, (see Chapter Five) fulfills P.L. 96-514 directives.

2.

2. The Final EIS consideration of the design solution alternative responds to your comment (see Chapter One, p. 1, and its use in the Preferred Alternative, p. 126, and Chapter Five, p. 121). A permit applicant will not be required to duplicate past studies or provide data beyond permitting decision needs. The petroleum industry may still reflect any risk in their bidding patterns.

showing all caribou, grizzly bear, polar bear, geese, peregrine falcon and other cliff-nesting raptors use patterns within a six mile area of the proposed activity. The maps and biological information will then be used to create stipulations to be attached to the permit.

Not only is the map requirement excessive, but it is duplicative because a lot of this work has either recently been done by BIM, or relevant research (including industry sponsored work) has been conducted in similar Kuparuk and Prudhoe Bay areas. Requiring additional ecological studies of the type described in the DEIS goes beyond the bounds of acceptable site specific requirements. It places a responsibility on the lessee that properly rests with the process of producing an environmental impact statement. Immediate site-specific surveys are acceptable and serve a purpose in facility siting. It is inappropriate to expand such surveys into the justification for collection of base-line biological data by the lessee. This approach to leasing increases the operational and economic risk to industry and will be reflected in bidding patterns.

As proposed, the seasonal drilling restriction from May 20 through August 25 would apply to all "Designated" NPR-A Coastline, barrier island and salt marsh areas on a case-by-case basis. It would apply not only to oil and gas exploration activities but also to operation and maintenance of producing wells. This stipulation is either proposed in ignorance, or is deliberately aimed at nullifying the leasing process in these areas. No responsible operator can agree to operate in this manner in this isolated an area. Seasonal production of an oil field is unacceptable.

The justification for the seasonal restriction stipulation was the need to protect "ninety (90) percent of the waterbird nesting, molting or staging use occurring within six (6) miles of the proposed activity area from singular or cumulative disturbance". This places major consideration on local disturbance even though in most cases a species has wide distribution. In Prudhoe Bay and Kuparuk, the two largest oil fields in the United States, oil and gas activities have not had significant adverse impacts on waterbirds (or caribou, or bear for that matter). Nesting, molting, and staging still take place within the confines of these operating units. The criteria for this and other stipulations should be to mitigate reasonably foreseeable significant adverse impact. Surely this stipulation is out of bounds.

Not only is the stipulation unreasonable, but identifying the tracts to which it applies after the lease sale is held is unfair. An oil company cannot be expected to bid on leases in areas where this stipulation might apply unless they take the risk that the stipulation will not affect their tract, or that if it does affect their tract, it will be deleted prior to any oil and gas production. Oil companies should not have to take this risk.

There are serious problems with the biological assessments in this document

3.

3. The Draft EIS concept of "Limited Surface Occupancy" you referred to has been dropped in the Final EIS. The Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) recommends procedures that tell the petroleum industry before a sale what will be required on specific tracts. Special lease stipulations for any sale will become final in a Notice of Sale in the Federal Register before sale.

including the Classification System used to determine risk of impact. The binary logic applied here is only indicative of the presence or absence of certain risks. It does not provide for evaluating any degree of risk nor the probability of occurrence. The risk designations shown in Table I-3 are based on the possibility of any impact, no matter how remote or severe.

This overly conservative approach to risk classification would be understandable for pioneer exploration attempts in a totally new environment. However, serious exploration has been conducted in the NPR-A since 1977 when Husky Oil Company began drilling a series of 21 wells for the USGS. Arctic exploration itself dates back to 1960. Since that time Prudhoe Bay and Kuparuk have been developed, the Trans-Alaskan Pipeline has been constructed, and numerous wildlife, vegetation, permafrost, waste disposal and engineering studies have been completed. Given the volume of knowledge and arctic experience, this exceptionally conservative risk assessment is not appropriate for the NPR-A.

Following the risk designations, the biological resources are discussed and impact scenarios assessed on a species-by-species basis. The overly conservative approach continues to be applied in these analyses. With Caribou in particular we find that the application of recent information is lacking. Why caribou in the NPR-A are compared with mammals on the African savanna is a mystery. They should be compared to the caribou that have been extensively studied in Prudhoe Bay and Kuparuk. Not only are their environments similar, but some of the ranges overlap both regions further justifying the correlation.

Further comments regarding the biological and environmental assessments in this document follow in an attachment that addresses these concerns with greater specificity. It should be noted here that there is no mention in the DEIS of an endangered species consultation with appropriate federal agencies pursuant to section 7(c) of the Endangered Species Act.

Evaluation of cumulative impacts certainly has a place in any EIS. Until available information on the existing environment and species distributions is adequately examined, the true effects of localized impacts cannot be assessed. When looking at the larger picture, isolated impacts often become insignificant.

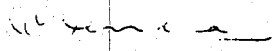
It is important, however, that when assessing cumulative impacts the scope of influential activities and regions is not exaggerated beyond realistic boundaries. It is far fetched to assume that the Cominco coal mine south of the Brooks Range, and possible exploration in the Chukchi Sea (not even considered for leasing until 1985) will add to the cumulative impacts on this NPR-A sale area. It would be more reasonable to limit the scope of the cumulative impacts evaluation to those areas that will realistically support activities and wildlife populations that interact with the NPR-A acreage.

4. Chapter One, p. 1, of the Final EIS has been revised to more clearly represent the subjective findings of the scoping process which preceded this EIS.
5. The Final EIS analyses are in keeping with the cause and effect relationships expressed in the recent literature and the differences between the Central Arctic Herd's and Western Arctic Herd's environments, ranges, population, movement patterns and importance to subsistence use.
6. The required endangered species consultation occurred before any leasing on the Reserve. At that time appropriate stipulations were adopted to be used in all future sales. Specific discussion of this process is contained in Chapter Four, p. 79, and the adopted stipulation is shown on Figure 20, p. 81.
7. The Final EIS treatments of likely levels of impacts on and adjacent to NPR-A meet NEPA guidelines. Modeling of concurrent North Slope development including potential NPR-A development is provided in Chapter Five, p. 121, as a response to this and other comments.

We find that the mitigating measures designed for every possible impact, regardless of its significance, leave too many unknowns. Sufficient biological information is available today for restrictions to be tract specific prior to a lease sale. The mitigating solutions, especially design solution leasing, no surface occupancy restrictions and seasonal drilling restrictions, are all too non-specific. What is expected of a lessee in terms of baseline studies, applied research and major operational constraints should be clear prior to a lease sale.

If you have any questions or would like further information regarding our comments in this letter or in the addendum, please feel free to call me at 263-5474.

Sincerely

  
Roger C. Herrera  
Alaska Exploration Operations Manager

RCH:0168b

8.

8. The Final EIS Preferred Alternative, p. 126, in Chapter Five recommends measures that are responsive to your desire "for restrictions to be tract specific prior to lease sale."

SOHIO ALASKA PETROLEUM COMPANY COMMENTS ON THE DRAFT  
ENVIRONMENTAL IMPACT STATEMENT FOR THE  
NATIONAL PETROLEUM RESERVE - ALASKA

SPECIFIC COMMENTS

1. Page iv, last paragraph:

The following statements are made in this paragraph:

Since there has never been a major industrial development within the caribou range of northwestern Alaska, a series of hypothetical development models was formulated for this DEIS as a basis for impact prediction. These predictions may or may not accurately reflect actual future patterns of any NPR-A petroleum developments. Nevertheless, both qualitative and quantitative impact predictions based on these models have been made. They met EIS requirements for wildlife impact predictions and provide information for use in lease tract evaluation.

The Preferred Alternative may lead to a reduction in the size of the NPR-A caribou herds and may result in alterations in seasonal distribution of caribou.

Should further leasing in NPR-A lead to oil and gas development(s), the result would decrease to some degree NPR-A's carrying capacity for caribou.

Although there has been no major industrial development in northwestern Alaska, the development of the Prudhoe Bay and Kuparuk oil fields and the TAPS line and the impact, or lack thereof, to the caribou would have provided far more meaningful information on which to base the impact predictions. The quantitative impact predictions are not substantiated by any of the research conducted in Alaska on caribou versus development conflicts and are based on some false assumptions (discussed in comments below). Indeed, as stated in the DEIS, the Caribou Discussion Panel could not support the quantitative impact predictions. Therefore, it is doubtful that these unsubstantiated impact predictions either meet the EIS requirements or provide useful information for lease tract evaluation and they should be deleted from this document.

2. Page v, last paragraph:

The following statements are made in this paragraph:

Vegetation damaged or covered during facility construction could be replaced by exotic species

9.

9. The Final EIS meets NEPA requirements for impact analyses. Similar examples of other Arctic developments have been used in their proper context as cause and effect analyses.

10.

10. The Final EIS has been appropriately revised.

during the rehabilitation phase which precedes site abandonment; however, the rehabilitation would not be restoration to original site conditions. The native plants that were destroyed should be viewed as irrevocably lost.

Observational studies accomplished around the Prudhoe Bay field by Sohio where tundra has been damaged by oil, drilling mud or other drilling fluids indicate that native revegetation of damaged areas is possible and can occur within a relatively short time period. H.M. French from the Dept. of Geography and Regional Planning, University of Ottawa, prepared a publication entitled Environmental Studies No. 6, Sump Studies: 1, Terrain Disturbances that was written from data collected in 1977 after visiting various old Alaskan and Canadian well sites. From his observations he has indicated that vegetation recovery is not the problem: what is important is to utilize careful engineering planning to reduce thermal degradation during facility construction and undertake a rigorous cleanup program after a drilling operation is completed. The following statements summarize the condition of various well sites in the NPR-A area after 25 years of abandonment:

An overall assessment of these sites suggests that the absence of sumps and the spilling of drilling muds directly upon tundra has not resulted in any long term environmental damage. In areas adjacent to the old rig, regrowth is sometimes more prolific than in adjacent undisturbed terrain. Typically, Calamagrostis and Poa grasses have colonized the disturbed areas. If the aesthetic, terrain disturbance and debris related problems are excluded, one must conclude that the drilling of these early wells without sumps has not been excessively harmful. In fact the degree of natural site restoration is remarkably high.

3. Page 7, Section F, Paragraph 4:

This paragraph states the following:

Consistent with CEQ Guidance that the DEIS should focus on resources and uses which are at risk of being significantly impacted, BLM has refined scoping into a valuable decision tool with broad benefits in multiple use planning.

This DEIS essentially has identified all possible impacts and has not adhered to the criterion of significant impacts nor given any consideration to a reasonable probability of occurrence implicit in the CEQ Guidance ("at risk of being significantly impacted").

11.

11. The Final EIS has not exceeded the findings of the scoping process, CEQ guidance or P.L. 96-514.



4. Pages 7-9, Section F:

These pages describe the "risk of impact" classification scheme used by BLM in evaluating the surface resources. This system is crude and inappropriate for focusing the efforts of a document of this type. It is not sensitive enough in that 1) the 4 risk factors, as applied, are too broad to be meaningful and are biased to the extremely conservative side, 2) "binary logic" only allows for the indication of the presence or absence of a factor and does not allow for an indication of the probability of occurrence nor its significance.

The result is that the process is ultra-conservative. This would be understandable if it were for an area that was entirely new and not completely understood. However, given that work on NPR-A has progressed over the past 6 years, including detailed biological studies, and given that the Prudhoe Bay, Kuparuk and TAPS projects provide applicable resource impact information, there is no reason for an ultra-conservative approach to impact predication and mitigation in this area. There is a wealth of information which has apparently been completely disregarded in preparing this document. If this information were utilized, a very effective risk of impact classification could be developed that would be based on actual experience.

5. Page 15, first paragraph:

This paragraph states the following:

Since NPR-A is a mosaic of environments and no one can predict where the affected environments will be, BLM decided to primarily focus on sensitive species which because of their migration patterns or use of areas of high perceived oil and gas potential would likely be exposed to oil and gas activities.

It is unclear why BLM did not use information from Prudhoe Bay, the largest oil field in North America, as well as from the Kuparuk oil field (both "mosaic", arctic environments) in determining the "sensitive species" and the probable types and levels of impact.

Also, what is indicated here regarding the BLM's focusing efforts is misleading since there was very little "focusing" on sensitive species at risk of being significantly impacted. For example, on page 9 of this DEIS the following is found:

The reader may justifiably wonder why BLM is including in the DEIS species which the EIS preparers have concluded would (a) only be exposed to oil development in insignificant numbers (b) or only encounter oil development on the periphery of their habitat(s).

12.

12. The Final EIS (Chapter One, p. 1) has been revised to more closely follow the findings of the EIS scoping process.

13.

13. Even though the Prudhoe Bay and Kuparuk oil fields are located in wet tundra, they are models for appropriate analogous examples applied in the hypothetical modeling of development in the moist tundra, dry tundra and other areas of NPR-A.

The Final EIS appropriately focuses on high risk resources and issues identified in the scoping process.

This statement readily admits that BLM included consideration of impacts that were not "reasonably foreseeable" (that is, had a realistic probability of occurring) nor "significantly adverse".

6. Page 15, Section II. A:

Those portions of the discussion resulting from the work of the Caribou Discussion Panel should be clearly identified. There are statements made in Section II which are inaccurate or misleading and should only be attributed to the Panel if, in fact, the Panel actually made these statements.

7. Page 17, first paragraph:

Regarding the Western Arctic Caribou Herd, the following statement is made: "...designation of specific areas with precise boundaries for caribou is neither feasible nor particularly useful when trying to predict caribou use patterns for each year's cycle." This is a major consideration that was virtually ignored when the quantitative impact projections were made later in the document.

8. Page 17, Paragraph 2:

Regarding the Western Arctic Caribou Herd, the following statement is made: "The calving zone shown will contain the greatest concentration of calving in most years, although in some years calving may occur outside this zone."

This would tend to support that there is some flexibility within the caribou population that accommodates calving outside the traditional area. There are still questions regarding how "critical" a traditional calving ground is to a caribou herd.

9. Pages 17 and 19:

These pages contain a lengthy quotation from Dr. Peter Lent describing that the Alaskan caribou situation was "analogous to the situation with the large, mobile mammals of the African savanna." On the basis of this quotation the DEIS authors conclude that:

"This statement documents the necessity for caribou access to all of NPR-A in order to maintain and increase their present population."

It is extremely difficult to understand why information regarding mammals of the African savanna is given such weight when information on Alaska's caribou and Russia's caribou has been disregarded. The Caribou Advisory Panel, consisting of 3 noted caribou biologists, prepared a recent report entitled An Assessment of Issues Concerning Caribou and North Slope Petroleum Development. The following

14.

14. The Final EIS is appropriately labeled to indicate Panel versus EIS team statements.

15.

15. This statement in Chapter Two, p. 22, refers to the highly variable movement patterns of the Western Arctic Herd. This variability is not ignored in quantitative impact analyses.

16.

16. The Final EIS Preferred Alternative (see Plate One, last page) has expanded the area in which specific conservation measures for caribou calving will be required in response to this and other comments.

17.

17. As mentioned previously, all analogous examples were employed to supplement hypothetical models. Dr. Cameron, author of the first report cited, and Dr. Lent were both participants on the Caribou Discussion Panel (Gilliam and Lent, 1982) in which numerous examples from Alaska, Canada, northern Europe and Siberia were analyzed.

The second document that you cite was not available for Draft EIS preparation but has been used in Final EIS preparation. The BLM feels Final EIS analyses are responsive to your comments.

statements are taken from this report prepared by A.W.F. Banfield, R.D. Jakimchuk and R.D. Cameron:

...In other instances, however, caribou have shown remarkable motivation and capability to overcome barriers when (a) under the impetus of migration and (b) under stress. In fact, caribou have re-established migrations across transportation corridors when population size has resulted in an increase in the extent of seasonal movements...Both crossings and deflections of caribou approaching elevated sections of the Trans-Alaska Pipeline have been observed... (page 4)

The most complete barrier to a caribou (wild reindeer) population is in the Soviet Union. On the Taimyr Peninsula fences have been utilized in conjunction with an existing gas pipeline to deflect reindeer away from the industrial city of Norilsk. The barrier has been in place 10 years, during which time the overall population of Taimyr reindeer has increased... (page 4)

The ability of a caribou herd [referring to the Central Arctic Herd] to grow in spite of substantial environmental changes indicates some degree of species adaptability. In fact, adaptability and resilience are generally characteristic of species successful in occupying harsh and changing environments. Thus, Central Arctic caribou have apparently been able to tolerate recent man-made changes in their environment... (page 12)

There are numerous site-specific studies regarding caribou/pipeline interactions in Prudhoe Bay and Kuparuk which indicate that although there may be some behavioral responses to pipelines, such a structure does not necessarily preclude crossing--a substantial percentage of the population will cross a pipeline. As will be discussed later, one of the major problems with the quantitative impact assessment for caribou is the assumption that every encounter with a pipeline/transportation corridor means a zero level of crossing success. This assumption is not substantiated in the scientific literature.

LGL Ecological Research Associates has just completed a document for the Kuparuk Unit entitled The Kuparuk Oil Field Ecosystem--A Literature Summary and Synthesis, and an Analysis of Impact Research. On page 23-24 of this document is found the following:

In summary, some kinds of responses of CAH [Central Arctic Herd] caribou to activities associated with petroleum development have been shown...It is noteworthy that none of these studies have shown that development to date has influenced herd recruitment or

population levels, despite its influence on caribou behavior. We view this point as critical, for it is the population levels and production of caribou that interest people. The connection between behavioral responses and populations responses needs to be clarified.

And on page 84:

But caribou reactions to industrial activities seldom reach the magnitude (in terms of states of "excitation", numbers of flight responses, or distances moved) of their reactions to intense insect attack. We think that the responses of caribou to man's activities are less obvious (i.e., less measurable) when caribou are harassed by insects because of the greater magnitude of response to insects. We found no literature reports that wild caribou population levels were affected by insect harassment...Thus it is not surprising that similar kinds of man-induced behavioral changes have not been demonstrated to have demographic consequences.

The type of information presented above should be used as the basis for impact prediction on arctic caribou populations, not an analogy to the mammals of the African savanna. This point will be emphasized later when the quantitative impact predictions contained in the DEIS for caribou are discussed.

10. Page 19, Section 2., Paragraph 2:

This paragraph states that the Central Arctic Herd's history and trends are "poorly understood". This is not the case, particularly when considering the level of scientific research that has been conducted when the caribou are on the coastal plain in the vicinity of the Prudhoe and Kuparuk oil fields.

11. Page 19, Section 3., Paragraph 1:

The comment that the herd "has been displaced from portions of its preferred calving areas" should be referenced. It is doubtful that there is sufficient justification for this statement.

12. Page 53, Section D:

The title of this section is "Oil Spill Risk and Response Analysis". There is no mention made anywhere in this section regarding oil spill response. Especially absent is any consideration of industry's oil spill capabilities, planning efforts, research efforts, response training, etc. There is an inaccurate discussion attempting to make some type of habitat classification regarding sensitivity to oil spills, however, there was no response analysis conducted.

18.

18. The appropriate section of Chapter Two, p. 22, has been revised. The "level of scientific research" on the CAH and its historic trends prior to Prudhoe Bay development is vastly different than the knowledge of present trends.

19.

19. Proper citation has been applied.

20.

20. The Chapter Three, p. 55, treatment of oil spills has been expanded to respond to this and other comments.

13. Page 53, Tables III-6 and III-7:

According to the background document prepared by Carufel, the following assumptions were made in preparing this information:

- a. Two data bases were used for spill prediction: all U.S. spills and spills occurring in Alaska.
- b. Pipeline spills refer to common carrier lines (Alaska Pipeline) and not production flow lines. Spill predictions were based on spill/rate/mile/day/operation.
- c. Large spill predictions were based on the median values of total recorded spills, while small spills were based on mean values.

The data bases should have been incorporated within the text of the DEIS to aid in the interpretation of the data tables presented. Also the time frame for the number of spills predicted should be clearly indicated. Some adjustment should be incorporated in the statistical analysis for the fact that drilling equipment, technology and practices on the North Slope are state-of-the-art. It should be noted that for Table III-6, production lines are included in the predictions for spills within or near oil fields. The pipeline spill predictions given in Table III-7 are based on the TAPS line and refer only to common carrier lines. Table III-6 should indicate the sources for the spills reported in the minor discharge category--do they include fuel transfers, construction-related spills, or incidental spills from surrounding pipelines?

Because of its derivation, information presented in the DEIS is unclear and very negative regarding moderate operational and pipeline spills. There is insufficient information presented to justify the risk predictions. The Trans-Alaska Pipeline spill history (incorporating incidents resulting from sabotage) is used as a data base with no distinction made regarding the difference between intrafield pipeline spills, or the lack thereof, and spills from a large system such as the TAPS which is more extensive, accessible and exposed. Industry's oil spill response capabilities are not adequately taken into account and no mention is made regarding ongoing research and response planning efforts.

The general organization and structure of the section is disjointed.

14. Page 54, Paragraphs 1-3:

The purpose of these paragraphs is unclear. The information presented is confusing, disjointed and for the most part an inaccurate reflection of natural containment features and habitat sensitivities. For example, it is stated that a spill would be easily contained by dry tundra and implies that this would be the best location for a spill. Actually, dry tundra is more damaged from an oil spill and is more difficult in which to conduct containment and cleanup operations. Wet tundra areas have been observed to recover substantially more than dry areas when subjected to oil and

salt water spills. Oil may spread on water (apparently the only criterion used in the DEIS for discussing containment) but more importantly, oil floats on the surface of water enabling effective containment, removal and recovery operations. A very significant factor is that the oil on the surface of water does not have a chance to percolate through the soil to the root system of the plants to cause significant damage. This makes site recovery and restoration very effective. Water also serves to dilute the contaminant, provide for microbial biodegradation and facilitate chemical degradation. It has been industry experience that oil in wet areas usually migrates to an area of low relief and collects.

15. Page 54, Paragraph 4:

There is no explanation of the derivation for the probabilities of spills in given habitat types contained in this paragraph. The information contained in this section overlooks several significant factors. The first is that for about 9 1/2 months out of the year the area, including wetlands, will be frozen and snow-covered. This significant consideration should have been factored into the statistical analysis because spill containment and cleanup on snow and ice is proven, straightforward, effective and efficient regardless of whether the spill is on dry tundra or wet tundra.

The information as presented in this section of the DEIS is meaningless and useless for spill response considerations.

16. Page 54, Paragraph 5:

Based on the comments presented above, there is insufficient justification for the conclusion stated in this paragraph as follows:

BLM has concluded, based on this analysis, that under the common sense useage of the word, spills in wetlands along the pipeline would occur frequently if there were commercial discoveries of oil found in, and produced from NPR-A.

17. Page 54, Paragraphs 6-7:

The information presented in these paragraphs does not accurately represent the regulatory situation regarding oil spills. ADEC has the enforcement responsibility within the State, but the primary prevention, cleanup and containment responsibilities lie with the permittee and/or operator. Federal regulations are also applicable regarding oil spills and hazardous substances planning, responding and reporting requirements.

18. Page 55, Section III, Paragraph 1:

This paragraph states the following:

This impact analysis stops at the "could" or "may" happen point; that is, the analyst does not predict

21.

21. The Final EIS focuses on the resources at risk of being significantly impacted as defined by the scoping process, CEQ guidance and P.L. 96-514.

likely impacts but instead lists possible effects. The list of possible effects is based on a review of existing conflicts between oil and gas development and surface values of areas experiencing oil and gas operations...

On the basis of this list of possible impacts, the DEIS analysts can identify mitigations which would eliminate "possible" impacts, or reduce them so substantially that the adverse effects would no longer be significant.

Comment #3 above responds to the DEIS assertion that CEQ Guidance to focus on resources at risk of being significantly impacted had been followed. As evidenced by information quoted above, not only has CEQ Guidance been disregarded, but also the clear criterion for mitigation of "reasonably foreseeable and significantly adverse impacts".

19. Page 58, Section B. 1.:

This section requires applicants to submit maps which identify significant fish and wildlife use patterns in the vicinity of any proposed activity as well as a demonstration that the applicant has adopted measures which would reduce possible impacts on fish and wildlife resources. In view of BLM's recent research within the NPR-A, it seems duplicative to map fish and wildlife use patterns. This work was or should have been done as part of the EIS process. The applicant should be asked to demonstrate protective measures which have been applied to his project based on existing BLM data.

20. Page 58, Section B. 2.:

This paragraph states that BLM may require further applicant studies before approving or disapproving any permit. While it is important to protect local and/or regional fish and wildlife values, it is also important to provide some predictability to potential lessees. Study requirements should be specific prior to the lease sale for all leases. Continuing studies conducted by BLM in preparation for the sale are adequate to determine which areas are biologically important as well as sensitive to activities which might result from the sale of leases on those lands.

21. Pages 59-60, Section 3, Paragraph 2:

This paragraph describes the seasonal restriction (May 20 to August 25) regarding any activity in any "designated" NPR-A coastline, barrier island or salt marsh. This restriction applies to "all phases of oil and gas activities including maintenance and operation of producing wells." Not only is insufficient information provided to substantiate the seasonal requirement in the first place, but extending seasonal restrictions to producing oil fields is an unacceptable mitigation measure. This type of operational constraint would prohibit development, no responsible operator would be willing to operate a producing oil field on a seasonal basis.

22.

22. The applicant will not be required to duplicate past work. The applicant may be required to supplement or interpret past studies, if necessary, to allow for informed permitting decisions. The BLM agrees that an applicant may be asked to demonstrate his protective measures.

23.

23. The Final EIS Preferred Alternative, p. 126, (see Chapter Five) recommends a leasing process that will make prepermitting study requirements reasonably predictable.

24.

24. The text of Chapter Three, p. 55, in the Final EIS has been appropriately altered.

22. Page 61. Fisheries:

The statement that "residual impacts to fisheries would remain even with the application of the buffer concept." should be qualified. The possibility of measurable impacts of this type would be remote.

23. Page 62, Paragraph 3, Water Quality:

No mention in this section has been given to ongoing studies that have been accomplished by industry in the Beaufort concerning the discharge of drilling muds and cuttings offshore. No mention was given to the permitting process that is required for discharge of these materials and that industry has been permitted to discharge, and that monitoring of these areas has indicated that no observable long term impact or damage to the surrounding environment has occurred.

Numerous studies by Sohio and others on the North Slope have indicated that damage to wetlands from oil spills is only a short term impact and that, in some cases, area recovery is enhanced by the natural fertilization effect of the petroleum compound.

24. Pages 65-74, Section 2, Impacts to Caribou...

These pages contain long discussions regarding qualitative and quantitative impact predictions to the various caribou herds under various analytical cases. Unfortunately, there is insufficient justification for making certain of the assumptions and no support in the scientific literature for the quantitative impact predictions. Impacts to caribou habitat or access must be translated into population-level impacts before the significance of the impact can be determined and the appropriate mitigation, if any is required, can be recommended.

The major problem with the quantitative predictions is that the assumptions are inaccurate. Although 20% of a given herd may encounter a transportation corridor, it is not correct to assume that 100% of this 20% will not cross the corridor. There is a considerable amount of scientific evidence that indicates not only will a certain percentage of caribou encountering a corridor cross the corridor, but the crossing success depends on other factors, not the least of which is the type and level of insect harassment. There has been no clear indication as to the significance of the behavioral responses of caribou to corridors relative to the population size and productivity. In fact, the Central Arctic Herd is growing considerably and it encounters industrial development throughout its range.

Comments #1, 9, 10, 11 are also applicable here.

25. Pages 65-95:

There are so many problems with the statements made on these pages, the assumptions used to derive the impact predictions and the overall

25.

25. Please refer to Final EIS Chapter Five, Section IV. G., p. 136, for appropriate revision.

26.

26. Final EIS Chapter Three, p. 55, has been appropriately revised.

27.

27. Chapter Five, p. 121, has been modified in response to this comment.



misconception regarding the significance and level of the probable impacts that it would be difficult to detail comments in a reasonable amount of space and time.

26. Page 95. II. RECREATION IMPLICATIONS

Data provided does not support the assumption that 335 canoeists and kayakers would utilize the NPR-A rivers if roads were opened into the area. What the data does support is a supposition that 335 canoeists and kayakers would range farther from Fairbanks if roads were available. The data supports the supposition that utilization of rivers and streams accessible along the Dalton Highway would increase, however, the data does not identify recreationists that are willing to travel one day or more to reach rivers and lakes within the NPR-A. Without data to support the assumption that all 335 boaters are willing to travel at least eight hours to reach recreational sites, the predicted impact should be reduced to, perhaps, 35 (10% of those willing to travel one hour or more). Assuming parties of two, the impacts on the Colville River could be assumed to be .2 per parties per day or one party every five days, which is a significantly different impact than that predicted in the DEIS.

A similar assumption may be made with regard to caribou hunting, although the factor might be somewhat larger (perhaps 25%), resulting in perhaps 100 additional hunters, provided hunting licenses were available.

27. Pages 96-99 III SOCIO-CULTURAL CHANGE:

The DEIS deals well with the continuing social problems which residents of the North Slope have experienced. It is especially good to note that the alienation that researchers have measured there was present prior to the discovery of North Slope oil and gas resources.

The importance, however, of future oil and gas development in relation to the North Slope Borough's policy of "full employment for Inupiat" should be more carefully evaluated. Without Prudhoe Bay revenues, the Borough would not have been able to implement its full employment policy. Continuation of Borough jobs is, in part, dependent upon continued oil and gas development on the Slope. The tax base provided by oil and gas development facilities must be expanded to provide tax dollars to fund employment for an expanding North Slope population. Without some form of additional development the economic base which the Borough relies upon will begin to shrink as the Prudhoe Bay Field begins to decline.

28.

28. Chapter Four, p. 79, has been modified in response to this comment.

29.

29. Appropriate sections of Chapter Four, p. 79, has been modified in response to this comment.



## Northern Alaska Environmental Center

218 DRIVEWAY  
FAIRBANKS, ALASKA 99701  
(907) 452-5021

December 8, 1982

Jerry Wickstrom, Program Manager  
NPR-A, Alaska State Office  
Bureau of Land Management  
701 C Street  
Anchorage, AK 99513

Dear Mr. Wickstrom:

These are the Northern Alaska Environmental Center's comments on the preferred alternative plan for the draft EIS on NPR-A Oil and Gas Development.

We are deeply concerned with the inadequate protection of critical caribou habitat and the disregard for the protection of the wild river qualities of the Colville, Nigre, Etivluk and Utukok Rivers.

The emphasis of the proposed caribou protection measures seems to be placed on maintaining numbers and does not adequately address protection of the ecological integrity of the Central Arctic or Western Arctic Caribou Herds. The plan also fails to recognize the importance of the Teshapuk Caribou Herd both for coastal subsistence uses and its unique population dynamics.

We recommend that:

- (1) The entire area around Teshapuk Lake and the fringe around the Utukok calving grounds be deferred as recommended by the caribou/waterbird impact analysis workshop.
- (2) At an absolute minimum, surface occupation should not be allowed during calving season in the above areas.
- (3) Particular attention and all possible mitigating measures should be employed to minimize disruption of caribou migration routes if any east-west transportation corridors are developed. An east-west transportation corridor will not be comparable to the Dalton Highway on impact of caribou migration because it would directly cross the principle migration path of the Central Arctic Herd.

Specific measures should include:

- (a) Closure of roads during heavy migration periods.
- (b) Convoys of trucks during other times.
- (c) Use of in field observers to determine when potential for migration interference exists.

### Response to Northern Alaska Environmental Center's Comments

1.

1. The Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) recognizes these concerns within a multiple use management framework. Special Management Zones have been placed around the Utukok calving area and Teshapuk Lake. Stipulations have been recommended to restrict petroleum activities during the caribou calving and migration periods (see Figure 20, p. 81). Additional NEPA compliance procedures will specifically address the issue of caribou migration and east-west roads under a Design Solution Concept requiring close BLM/Permittee cooperation in providing effective mitigation. The measures you suggest have merit as mitigations. In our discussions with the Alaska petroleum industry, we have found them totally receptive to all reasonable mitigations.

We are also concerned with the lack of identified protection measures for the wild qualities of the four rivers designated as study rivers under the Wild and Scenic Rivers Act of 1968 (P.S. 90-542) by ANILCA. It is our understanding that the 105(C) studies completed for NPR-A satisfy the requirements for reports on the study rivers and all four rivers were found to possess characteristics qualifying them as wild rivers. These characteristics must be protected until Congress has acted on the deadline of October 1, 1984 passes.

Current gravel extraction operations on the Colville River have the potential to compromise wild river values. Section 7(C) of the Wild and Scenic Rivers Act requires that all Federal agencies inform the Secretary of the Interior of any activities within their jurisdictions which affect or may affect any of the rivers. We would appreciate a copy of this report submitted to the Secretary of the Interior to more fully understand what mitigating measures are being taken with regards to gravel extraction.

Thank you for this opportunity to comment. We look forward to hearing from you on the Colville River gravel extraction reporting letter. Please keep us informed on any further meetings or developments on this issue.

Sincerely,



Brian Allen  
Executive Director

cc: Senator Ted Stevens  
Senator Frank Murkowski  
Representative Don Young  
Representative Jon Seiberling  
Senator Paul Tsongas  
Eric Smith, Trustees for Alaska  
David Finklestein, Alaska Lands Act Coordinating Committee  
David Cline, Audubon Society

2.

2. All wild and scenic study river areas are withdrawn from leasing until September 1984. Please see the Preferred Alternative, p. 126, (see Chapter Five).

3.

3. As you may recall the Heritage Conservation and Recreation Service (HCERS), during the 105(c) studies, surveyed the Colville River and assessed its potential as a Wild and Scenic River. The HCERS study concluded that the Colville downstream from Umiat lacked the characteristics of a Wild and Scenic River. The Congress, in Section 604(b) of the Alaska National Interest Lands Conservation Act (ANILCA), stated that the 105(c) report "...shall satisfy the requirements of (the study provisions of the Wild and Scenic Rivers Act)." The gravel extraction that you asked about was in the area of the Colville River not recommended by HCERS for inclusion in the National Wild and Scenic Rivers System. Gravel extraction proposals for the Colville River downstream from Umiat have been, and will continue to be, evaluated for potential impacts on the river's wildlife, aesthetic quality and other values in accordance with and as satisfaction of the provision of the Wild and Scenic River Act (WSRA), as amended by Title VI of ANILCA, and the procedures required by the National Environmental Policy Act. This evaluation was done for the gravel removal operation you mentioned and it was concluded that the gravel operation could, incorporating BLM's mandated mitigations, proceed without threat to the river's value. Copies of our analysis are available from Tom Dean, Arctic Area Manager, Fairbanks District.

## memorandum

*Received 12/14/82  
NPR-A, mdt*

DATE: December 10, 1982

REPLY TO  
ATTN OF: Area Realty Officer, JAOSUBJECT: Comments on October 1982, Draft EIS: Oil and Gas Leasing  
of NPR-A.TO: Bureau of Land Management, Chief, Environmental Service  
Staff  
Attention: George R. Farris

Attached are the comments from part of the Juneau Area  
Staff of the Bureau of Indian Affairs. The remaining  
comments will be transmitted as soon as they are received by this office.

  
L. Bruce Bowler

Attachment

BUREAU OF LAND  
MANAGEMENT  
ANCHORAGE, ALASKA  
DEC 13 10 33 AM '82



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10  
(REV. 7-79)  
GSA FPMR (41 CFR) 101-11.6  
5010-112

Draft EIS on oil and gas leasing and development in the National Petroleum Reserve in Alaska.

If indeed the preferred alternative may lead to a reduction in the size of the NPR-A caribou herds the effect upon the subsistence users could be extremely disastrous. The effect of such a possibility should be studied on a site - specific basis prior to drilling activities.

Those aspects of oil development adjacent to Native allotments require special consideration as to the impact both to the wildlife resources in the area and to the actual effect to a particular Native allotment.

Design solution leasing would seem to be a realistic way to protect the sensitive Arctic Slope environment on a site - specific basis. Leasing of areas that are adjacent to human habitat would fall into this category.

Page 13: Drilling permits themselves should address possible mitigating measures of the proposed types of activity. They would employ a site - specific method of mitigation.

Page 19: If we follow the premise that caribou must have access to all of NPR-A in order to adequately survive, care must be taken to insure that disruption of their migratory routes does not occur. Restrictions upon pipeline placement is extremely important.

Page 34: A Federal Permit that allows the permit applicant to enter on a Native allotment for purposes of development must be reviewed by the Bureau of Indian Affairs particularly in the case of restricted allotments held in trust.

Page 56: It is our understanding that during oil development construction and involvement oil field workers will be restricted from using the wildlife resource in a given area. If this is correct an approved plan prior to actual development should accompany the permit application. By outlining the do's and don'ts that workers will be subject to, the concerns of local subsistence users should be alleviated.

Page 66: Upper Colville River Development should take place prior to pregnant cow caribou movement, especially not during the calving season.

Pipeline corridors should be constructed in such a manner as to lessen impact to caribou migration. Those studies made on the Trans-Alaska Pipeline System that spell out mitigating effects of caribou migration along pipeline corridors should be incorporated in the final EIS.

The reduction of availability of caribou to the subsistence users of Anaktuvak Pass will cause a good deal of hardship. Mitigating measures to protect the caribou in this area must be extremely well planned.

1. 1. The Final EIS Preferred Alternative, p. 126, in Chapter Five recommends both leasing and permitting processes responsive to these comments.
2. 2. The BLM agrees.
3. 3. The Final EIS Preferred Alternative, p. 126, in Chapter Five addresses recommended treatment of Native allotments on the NPR-A. The BLM will meet all procedural requirements.
4. 4. Your understanding is correct.
5. 5. The Final EIS in several sections and the Preferred Alternative, p. 126, have specifically been revised to address your comments.

Deferral leasing as mentioned on page 89 seems to be a reasonable attempt at mitigating effects to the wildlife resources of NPR-A and should be incorporated in actual lease stipulations, only by protecting the wildlife resources can be assured that the rights of the subsistence user will be protected. The stipulations outlined on pages 91-95 appear to have this goal in mind.

The design solution alternative should be further explored and tested to actually determine its effectiveness in mitigating impacts to caribou. If the development of NPR-A is going to have a profound impact on the Native residents of the area in their subsistence gathering, the burden placed upon them to develop other resources may be too much to bear. Increased costs to fuel to be able to range farther in search of caribou will place an economic impact upon people who are already over burdened.

The adoption of the preferred alternative as set forth by BLM is a reasonable approach to a very complex program and should be incorporated prior to development in NPR-A.

If at all possible it would be wise to incorporate into the permitting activity tract specific mitigation measures, especially for those tracts that are adjacent to villages, main river system, etc. In this way local input can become a viable factor.

UNITED STATES GOVERNMENT  
memorandum

DATE: November 30, 1982

REPLY TO  
ATTN OF: Subsistence Specialist

SUBJECT: Review & Evaluation of the Draft Environmental Impact Statement on Oil &  
Gas Leasing and Development in the National Petroleum Reserve in Alaska

TO: Environmental Protection Specialist

This EIS is comprehensive and objective in its presentation, it does not deny that damage will be done to the environment and the wildlife living in the affected areas. In fact, it frankly states that there is a probability that wildlife will be adversely affected.

1. Congress has made it clear that the reserve will be developed.
2. Congress has also made it clear that the natural resources must be protected and that subsistence use of the resources will be preserved

The question seems to be how can both of these mandates be met.

Naturally, the Eskimo is deeply concerned. This refers us to studies made on the affect of the Alaska pipeline on the migration of caribou, although caribou seem to be adapting to the pipeline, cows and calves still avoid it.

Eskimos are concerned that the "boxing in" of caribou by pipelines, the trucks, construction and aircraft will be extremely harmful to their reproduction and general well being.

Eskimos are concerned that the pipeline and its accompanying activities will drive caribou away from the coast, the normal retreat the caribou uses from insects. They claim that to cause the caribou to change its normal survival activity will kill them.

Frankly the unknowns are unlimited. No one knows where development will actually take place. No one knows the extent of the activity. No one knows the actual impact on the wildlife until actual parameters are delineated.

Strict controls are indicated, as they are in every development of this area. However, there are cases in which the Eskimos are documenting gross violation of the environmental requirements. These violations continue to grow.

Suggestions: Would it be possible for the Department of the Interior to contract with a Native organization to provide overview of the work being done from the environmental perspective? These people would not deal with the oil companies or construction crew. They would report periodically on

6.

6. The Final EIS and the Preferred Alternative, p. 126, have been revised to address your comments.

The BLM in its Preferred Alternative, p. 126, places emphasis on continued close coordination and consultation with the Eskimo through the North Slope Borough. The BLM has repeatedly urged anyone with evidence of permit violations to forward this information to the Arctic Resource Area Manager in the BLM Fairbanks District Office.



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10  
(REV. 7-78)  
GSA FPMR (41 CFR) 101-11.6  
5010-112

the EQ as the work progressed. Their voices would also be heard in suggested improvements, modifications or possible suspension of operations if required.

It stands to reason that whatever avenue the Department of the Interior takes, it must guarantee that the quality of the environment is protected to the fullest.

Don P. Barrett





# United States Department of the Interior

GEOLOGICAL SURVEY  
RESTON, VA. 22092

In Reply Refer To:  
EGS-Mail Stop 423

DEC 3 1982

ANCHORAGE AK.

DEC 10 1 05 PM '82

MAIL ROOM

Received 12/10/82  
NPR-A 12/15

## Memorandum

To: State Director, Bureau of Land Management  
Anchorage, Alaska

From: Assistant Director for Engineering Geology

Subject: Review of draft environmental statement for oil and gas leasing  
and development in the National Petroleum Reserve in Alaska

### Response to USGS's Comments

We have reviewed the draft statement as requested in your letter of October 1.

Our principal concern is the proposed removal of the central calving area of the western Arctic herd of caribou from consideration for leasing (p. iv), especially as delineated with buffer zones in figure 3. We believe that this area has good potential for petroleum, as indicated in the following references:

Miller, B.M., and Bird, K.J., 1978. A preliminary report on the appraisal of oil and gas resources in the National Petroleum Reserve of Alaska by the U.S. Geological Survey: unpublished administrative report, 63 p.

U.S. Department of the Interior, Office of Minerals Policy and Research Analysis, 1979, Final report of the 105(b) Economic and Policy Analysis: Alternative overall procedures for the exploration, development, production, transportation and distribution of the petroleum resources of the National Petroleum Reserve in Alaska (NPRA), 145 p.

We recommend that further consideration be given to modifying the removal of the calving area or reducing the area of removal, perhaps by application of such mitigation as is suggested in the U.S. Geological Survey's (USGS) 1979 report, An Environmental Evaluation of Potential Petroleum Development on the National Petroleum Reserve in Alaska (p. 29).

Effects on surface water resulting from leasing are briefly listed in the draft statement, but the significance of these impacts and whether

1.

1. Your reference to Draft EIS Figure 3 "Hypothetical Caribou Use Zones" (Final EIS Figure 5, p. 26) is confusing. All materials cited were considered in the formulation of the Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page).

The material on page 29 of USGS (1979) was written by this EIS team's wildlife biologist and was reconsidered in this EIS process.

2.

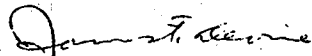
2. Final EIS Chapter Three, p. 55, has been revised in response to this and other comments.

they could be mitigated are not discussed (p. 61, par. 3 and 4; p. 62, par. 3). Although possible mitigations are addressed in the 1979 USGS report (p. 14-15, 22-24), it would be appropriate for the environmental impact statement itself to indicate what mitigation would be required and to clarify whether site-specific stipulations or design solutions would be applied (as is made clear for wildlife mitigations).

Similarly for ground-water resources, several impacts are mentioned in the environmental statement but requirements for such mitigating measures as are suggested in the USGS report are not discussed. These potential impacts include depression of the water table to supply needed water, discharges or spills of saline water used to supplement scarce freshwater supplies, and ineffective containment or accidental spills of oil, drilling muds, or raw sewage. Because the active zone above permafrost is extensive and contains perched ground water, the analysis of potential pollution should include both direct effects within the active zone and subsequent effects on surface water and on the unfrozen zone (talik) beneath streams and lakes.

In view of the brief treatment of the hydrologic environment and related impacts in the draft statement, we suggest that it would be useful to provide earlier and more prominent mention of the 1979 USGS report. This report, which is incorporated by reference in the environmental impact statement, includes fuller discussion of geologic and hydrologic concerns than does the draft statement.

To write "no surface occupancy restrictions" when there are restrictions on surface occupancy may mislead anyone not familiar with environmental jargon (p. iv, 64, pl. 3, etc.).

  
James F. Devine

3.

3. Impact on groundwater resources was not a specific significant issue emerging from the EIS scoping process. The USGS (1979) report, included by reference in this EIS, provides an adequate treatment without repetition in this EIS. Impacts on groundwater resources would be an issue for specific permitting process required in the NEPA compliance procedures.

4.

4. The text has been revised to respond to this comment in Chapter Two, Section I. A., p. 22.



U.S. ENVIRONMENTAL PROTECTION AGENCY  
REGION X  
1200 SIXTH AVENUE  
SEATTLE, WASHINGTON 98101

*Received 12/2/82  
NPR-A, mSB*

REPLY TO  
ATTN OF

M/S 443

DEC 1 1982

Bureau of Land Management  
Alaska State Office  
NPR-A (916)  
701 C Street, Box 13  
Anchorage, Alaska 99513

ATTN: Mr. Jerry C. Wickstrom  
NPR-A Program Manager

RE: Oil & Gas Leasing & Development in the NPR-A  
EPA Review Comments

Dear Mr. Wickstrom:

The Environmental Protection Agency (EPA) has reviewed the Draft EIS on Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska (NPR-A). The Draft EIS provides a good discussion of the resources which could be affected by further oil and gas exploration in the NPR-A. It also provides a useful picture of the expected exploration activities and the development activity which might occur, if commercially recoverable oil or gas reserves are discovered.

The Draft EIS notes (page 9) that "...the BLM State Director for Alaska will make major decisions regarding the future administration and management of NPR-A including: whether to lease; when and where to lease; and how best to manage development to assure reasonable protection of existing surface values and uses." The EIS specifically solicits the suggestions of the public on the degree of environmental mitigation which should accompany oil and gas exploration and development in NPR-A. Within this context the Draft EIS discusses "standard requirements leasing," alternative forms of deferred leasing, and "design solution leasing," and identifies the types of environmental impacts which could occur. It does not attempt to predict the types of impacts that would probably occur or their potential magnitudes.

On pages 100-102 and Plate 8, a particular comprehensive, integrated leasing and management strategy is identified as the preliminary preferred alternative. This alternative is not developed or analyzed, as a whole, anywhere in the EIS; nor, are the factors presented which lead BLM to conclude that this alternative is preferable. No other integrated strategy with a different structure or a different "balancing" of the elements is described or evaluated in the Draft EIS.

Response to EPA's Comments

1. The Final EIS has been revised based on the comments the Draft EIS solicited. It clearly presents impact analyses and recommended mitigations in support of a decision selecting the best leasing program for the NPR-A.
2. The analyses within the Final EIS have been revised to fit the more structured approach suggested. Three integrated alternative leasing programs are presented in Chapter Five, p. 121, based on different interpretations of P.L. 96-514 and different combinations of alternative leasing strategies (see Chapter One, p. 1).

This EIS does not contain a thorough comparison of alternatives or a rigorous evaluation of their environmental consequences. These are particularly serious omissions, given that we have relatively good baseline environmental data for the NPR-A and over a decade of oil & gas exploration and development experience on Alaska's North Slope. This information could have been used as the basis for evaluating the probable environmental impacts of NPR-A oil and gas exploration and development.

We urge that these omissions be corrected in the Final EIS. It should discuss reasonable alternative, integrated leasing and management strategies for the NPR-A and evaluate their probable environmental impacts. The Final EIS could then identify a preferred alternative and describe the factors which lead BLM to its selection.

The absence of a rigorous analysis of the environmental impacts of the preliminary preferred alternative in the Draft EIS prevents EPA from reaching any conclusions regarding the unacceptability of the environmental impacts of the proposed action in terms of public health, welfare, and environmental quality. We are therefore rating the Draft EIS, "3" [inadequate].

We appreciated the opportunity to review this report. We have enclosed more detailed comments that identify specific methodological problems in the Draft EIS for your consideration. Should you care to discuss our comments you may contact Mr. Dick Thiel, our Environmental Evaluation Branch Chief, at (FTS) 399-1728.

Sincerely,



John R. Spencer,  
Regional Administrator

Enclosure (1)

EPA's Technical Comments on the DEIS for Oil and Gas  
Leasing & Development in the NPR-A

Page 7, last paragraph: The Final EIS should note that the "binary logic" classification factors do not account for local geographic variability of a species. Thus, although the risk factor for a species may be low over the entire National Petroleum Reserve of Alaska (NPR-A), it could be high in some locations. For example Whistling Swan are ranked low within the DEIS' classification system, but the species is very sensitive to human activity. Thus, should petroleum development activity occur southeast of Teshekpuk Lake and east to the Colville River, significant impacts to the regional swan population could occur.

Page 37, paragraph 6: "Habitat Disruption" should be added to the list of Environmental Quality Issues associated with development.

Page 53: The Draft EIS indicates that there could be approximately 4,000 minor oil production related spills and 15 to 20 major oil transportation spills associated with the development of the NPR-A. The Final EIS should contain an evaluation of (1) the adequacy ADEC's current oil spill response plans in light of the potential developments in NPR-A and (2) our ability to contain and clean up on land oil spills in arctic environments.

Page 61, paragraph 1: The Draft EIS describes a fishery protection lease sale stipulation that has been used in the two prior NPR-A lease sales but does not indicate whether it would be used to protect other fishery streams in future lease sales. The Final EIS should evaluate this stipulation's use for future lease sales.

Pages 67-73, analytical cases: The analytical cases that evaluate "sample" development scenarios require many broad assumptions and are often confusing. These assumptions reduce the credibility of the results significantly. If they cases are to be carried through to the Final EIS, they should be presented in an appendix with some discussion of the large uncertainties which result from the assumptions. The preferred approach, as noted in the text of this comment letter, would be to use the North Slope experience as the basis for predicting the impacts of NPR-A development.

Page 68, paragraph 1,  
Page 78, paragraph 4: The mortality rate statistics appear to be highly speculative. EPA suggests that the supporting literature for the analytical cases be referenced in the Final EIS.

Page 82, paragraph 7: The methodology used to develop population impact projections for white fronted geese is questionable. EPA suggests that the Final EIS reference the literature sources used to develop this methodology.

3. This section of Chapter One, p. 1, has been revised in response to this and similar comments. The whistling swan was not designated a key species in the scoping process which preceded this EIS. The current BLM permitting process is capable of conserving resources such as whistling swan during permitted activities.
4. "Habitat" implies biological use which is inappropriate in a discussion of physical parameters.
5. The oil spills section in Chapter Three, p. 55, has been totally revised to incorporate the majority of source material.
6. The Preferred Alternative, p. 126, in Chapter Five addresses the continuing use of prior sale stipulations with appropriate changes.
7. The Final EIS Chapter Four, p. 79, analyses have been revised in response to this and other comments. Analogous examples from North Slope industrial activities have been used whenever possible to illustrate expected cause and effect relationships.

Page 91, paragraph 4: We suggest that the criteria (environmental evaluation procedures) to be used by the Bureau of Land Management's District Manager to decide whether or not to restrict facility siting be outlined in the Final EIS.

Page 100: Since the Coville River is the most important drainage basin within the NPR-A, EPA suggests that any proposed alternative should consider a comprehensive management plan to maintain the environmental integrity of that river. The management plan should address wetland habitat and water quality. A specific buffer zone should be considered for the Coville River to include all wildlife species, not just raptors.

8.

8. As indicated in the Final EIS discussions, the "criteria (environmental evaluation procedure) to be used" will be the specific NEPA compliance procedure for each permitting process.

9.

9. The Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) responds to the suggestion by recommending conservation measures to maintain the diversity of values along a large part of the Colville River. The BLM recognizes the need for comprehensive management of multiple values along the Colville River and has begun a process, beyond the scope of this EIS, to coordinate Colville River management with other adjacent land managers.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

NOV 19 1982

Recd - 11/26/82  
NPR-11  
MTB

NPR-A Program Manager (916)  
Alaska State Office  
Bureau of Land Management  
701 C Street, Box 13  
Anchorage, Alaska 99513

Response to NRC's Comments

Dear Sir:

This is in response to your request for comments on the draft environmental impact statement on the proposed oil and gas leasing and development program in the National Petroleum Reserve in Alaska (NPR-A).

Thank you for your review.

We have reviewed the statement and determined that the proposed action has no significant radiological health and safety impact, nor will it adversely affect any activities subject to regulation by the Nuclear Regulatory Commission.

Since we made no substantive comments, you need not send us the Final Environmental Statement when issued.

Thank you for providing us with the opportunity to review this draft environmental statement.

Sincerely,

Daniel R. Muller, Assistant Director  
for Environmental Technology  
Division of Engineering  
Office of Nuclear Reactor Regulation



DEPARTMENT OF THE ARMY  
ALASKA DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 7002  
ANCHORAGE, ALASKA 99510

REPLY TO  
ATTENTION OF:

NPAEN-PL-EN

*Received, APR-77*  
*11/24/82*  
*m 75*

21 NOV 1982

Mr. Jerry C. Wickstrom  
Bureau of Land Management  
Alaska State Office  
NPR-A (916)  
701 C Street, Box 13  
Anchorage, Alaska 99513

Response to Corps of Engineers' Comments

Dear Mr. Wickstrom:

The Alaska District, Corps of Engineers has reviewed the Draft Environmental Impact Statement on Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska, dated October 1982, and has the following general comment.

The Department of the Army, under Section 404 of the Clean Water Act, has regulatory responsibility over considerable acreage in NPR-A. This responsibility includes the placement of dredged or fill material in waters of the United States including adjacent wetlands and flood plains. Although you stated the objective of the environmental impact statement was for leasing only and further analysis of site specific development would be required, it should be noted that there may be restrictions to development even within areas not deleted or deferred.

Thank you for the opportunity to comment. If we can be of further assistance, please contact Mr. John Burns of our Environmental Resources Section at 552-2572.

Sincerely,

*[Signature]*  
HARLAN E. MOORE  
Chief, Engineering Division

Thank you for your review. The BLM recognizes the Department of the Army's regulatory responsibilities on the NPR-A that may be of paramount importance in ensuring effective site-specific mitigations on applicable permitting actions.





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE  
WASHINGTON, D.C. 20330

Received 12/14/82  
NPR-A, 177B

NPR-A Program Manager (916)  
Alaska State Office,  
Bureau of Land Management  
701C Street, Box 13  
Anchorage, Alaska 99513

8 DEC 1982


Response to USAF's Comments

Dear Sir:

On behalf of the Department of Defense we have reviewed the  
Draft Environmental Impact Statement on oil and gas leasing in  
the National Petroleum Reserve in Alaska, dated October, 1982. We  
have no comments on this document.

Thank you for your comments.

Sincerely,

  
ROBERT L. KLINGENSMITH, Col, USAF  
Chief, Environmental Division  
Directorate of Engr & Svcs

DEC 13 1 45 PM '82  
BUREAU  
ANCHORAGE AK



IN REPLY REFER TO:

## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
1011 E. TUDOR RD.  
ANCHORAGE, ALASKA 99503  
(907) 276-3800

14 DEC

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DEC 15 10 44 AM '82

BUREAU OF LAND  
MANAGEMENT  
ANCHORAGE

Curtis V. McVee  
Bureau of Land Management  
State Director for Alaska  
701 C Street  
Anchorage Alaska 99513

Dear Mr. McVee:

The U.S. Fish and Wildlife Service (FWS) has reviewed the Draft Environmental Impact Statement (DEIS) on Oil and Gas Leasing and Development in the National Petroleum Reserve (NPRA) in Alaska.

### General Comments

The goal of brevity in decision documents of this nature is commendable, particularly as extensive background documents on resources and impact analysis are available. However, it is important that existing information be adequately summarized and utilized as a basis for identifying and evaluating potential impacts. Surface resources of the NPRA are of nationally recognized importance and deserve necessary and appropriate mitigation of reasonably foreseeable adverse impacts.

In the DEIS, the estimates of numbers of wildlife potentially lost due to oil and gas related activities are not sufficiently supported by information such as confidence levels, clear designations of the assumptions involved, and proper citation of information used in deriving the numbers to permit evaluation. In some instances, quantification of losses does not include consideration of important factors that would contribute to the impacts on the species in question. For example, the reduction in grizzly bear populations is based on a prediction that 47 bears may be lost from a sustainable population of 400 to 450 bears over a 35-year period. The derivation of this number does not take into account the population status of the bears (are they currently at, exceeding, or below their carrying capacity), the potential for increases in sport hunting and illegal kills, potential disruption of movement patterns, and alteration of food sources or other important habitat requirements. Considering the numerous variables involved in deriving realistic numbers and the potentially high variation involved, presenting exact numbers can be misleading. In general, a more detailed explanation of the methodology involved would provide a more meaningful analysis.

The topic of contaminants (Oil Spill Risk and Response Analysis, page 53) should be expanded to include a discussion of the fate and effects of spilled materials, including long-term threats and clean-up contingency planning. Drilling muds and cuttings merit further discussion as a contaminant source in terms of magnitude and toxicity to fish and wildlife. Low levels of contami-

### Response to FWS's Comments

1.

1. The Final EIS has been revised, as appropriate, to respond to your comments.

2.

2. The Final EIS Oil Spills Risk and Response Analysis, p. 65, (Chapter Three) has been revised to respond to this and other comments.

nation from hydrocarbons and heavy metals can occur under presently permitted activities. Such contamination over time can alter or destroy aquatic invertebrate populations, which are extremely important as food for shorebirds and waterfowl. These birds in turn are important food items for peregrine falcons, other raptors, and foxes. Fish are utilized by a variety of animals and support sport and subsistence uses. They, too, can be drastically influenced by long-term, low levels of contamination.

The impact of a road system traversing NPRA would be far-reaching and long lasting due to increased human access and disturbance. Conflicts between subsistence uses and sport hunting, as well as increased harvest of game species, are likely. Surface access to villages previously isolated except for air transport may dramatically alter village lifestyles. These impacts should be identified and discussed relative to the transportation network that would be necessary for development activities throughout NPRA.

The description of impacts to the existing peregrine falcon population and the protective stipulations discussed with our Office of Endangered Species appears adequate. However, stipulations developed for peregrines will not protect other raptors. Nesting areas and concentrations differ among raptor species and some species, notably gyrfalcon and golden eagle, are more sensitive to disturbance than are peregrines.

#### Specific Comments

Page 11-12. The alternatives section would be more informative if it identified and described the preferred alternative.

Page 15-29. We suggest that Section II Biological Resources be reorganized; it skips from mammals to birds to mammals and back to birds. Mammals and avifauna should be treated separately in individual sections.

Page 21, line 1. Relatively small numbers of snow geese are regular users of coastal NPRA. This area and Howe Island, near Prudhoe Bay, are the only areas where snow geese breed in the United States.

Page 21, lines 15-16. There is no evidence to support the statement that "the entire non-breeding segment of brant from nesting areas north of the Bering Straits in Canada, Alaska and Siberia molt" in the Teshekpuk Lake area. It would be more accurate to state that a portion of the non-breeding segment from the Yukon-Kuskokwim Delta, Wrangel Island and the Siberian mainland, Alaska's North Slope and the Mackenzie and Anderson deltas in Canada molt here.

Page 21, line 17. The sentence implies that Teshekpuk Lake itself is the single attraction to molting brant. The lakes north and east of Teshekpuk are also used each year by black brant and other geese. We suggest substituting for the word "lake" the phrase "Teshekpuk Lake area."

3. The BLM believes Final EIS consideration of the potential impacts of hypothetical road systems to be adequate under NEPA in the absence of any "proposed" road systems. Increases in sport hunting take should be small and will be regulated by Alaska Department of Fish and Game. Any proposed road access to NPR-A villages would require a separate NEPA compliance process. The Preferred Alternative, p. 126, in Chapter Five recommends restriction of industry built roads to industry use with a separate NEPA compliance procedure to consider public access.
4. The Final EIS Preferred Alternative, p. 126, in Chapter Five and the BLM permitting process would provide for adequate conservation of other raptors.
5. Final EIS Chapters One, p. 1, and Five, p. 121, have been revised to respond to this comment.
6. Rewriting this EIS to match the "current" classification system may frustrate communication as individuals commenting during scoping generally used the older classification scheme.
7. Comment noted. Snow geese were considered in the scoping process.
8. Appropriate revisions in the Final EIS have been made in response to these comments.

Page 21, line 18. Figure 4 on page 18 erroneously depicts the designated area as containing "over 95% of brant molting habitat." Lakes southeast of the boundary shown in Figure 4 had a total of 4,770 brant in July 1978, which is about 14.5 percent of the population using the Teshekpuk Lake area. This figure did not appear in Derksen, Eldridge and Rothe (1979) as is indicated on page 18. It is an adaptation of a figure first published in Derksen, Weller and Eldridge (1979) and reprinted in Derksen, Eldridge and Rothe (1979) on page 284. We suggest that Figure 4 be replaced with Figure 8-12 in Derksen, Eldridge and Rothe (1979) or Figure 3, page 194 in Derksen, Weller and Eldridge (1979) (copy attached) since it provides relative flock size and distribution of flocks on individual lakes in the Teshekpuk Lake area.

Page 21, lines 21-22. We suggest that you point out that brant also are dependent on vegetation for food in coastal areas from Cape Halkett to Drew Point for up to 30 days following molt.

Page 21, line 29. We suggest that you reword to: "areas in Puget Sound, Baja and mainland Mexico."

Page 21, lines 30-31. We suggest that these two sentences be replaced by the following: "Brant and other geese molt in remote, traditional areas away from disturbances."

There is no discussion of Canada geese in Section II B. There are up to 16,000 lesser Canada geese molting on lakes in the Teshekpuk Lake area annually (see Derksen et al. 1979 a, b). This is a significant concentration of birds which should be discussed.

Page 21, lines 32-40. White-fronted geese also move through mountain passes in NPRA (the KILLIK River, Etivluk River, Anaktuvuk River), as well as passes to the east during both fall and spring migrations.

Records indicate (R. King NPRA studies 1977-78) areas of the central Meade River east to the Ikpiuk River are critical to spring migrants. These sandy areas provide the first open water for white-fronted geese and other water-birds during spring migration.

Page 27, line 4. The word "oldsqaw" (sic) is misspelled.

Page 52. It would be helpful to include a map indicating the location of fields listed in Table III-4. Additional areas that should be included on the list include the Milne Point Unit, which is in the initial stages of production, and the Sag Delta/Duck Island Unit. Permits for production of both facilities have been applied for.

Page 64. Standard requirement leasing would also not be effective in preventing impacts from gravel placement to shorebird and waterfowl habitat in wetlands.

Page 65, line 2. The reference to Plate 4 should be to Plate 3.

9. Canada geese did not emerge as a significant issue from the EIS scoping process.
10. Chapter Two, p. 22, has been revised in response to these comments.
11. Some of these fields on Final EIS Table 11, p. 64, are shown on Final EIS Figure 23, p. 143.
12. The BLM disagrees. Standard requirements implies the use of all current authorities including that of the Department of the Army. The Section 404 permitting process on the North Slope has been very effective in the opinion of the BLM.

Page 81, lines 7-10. We suggest that two additional studies, representing intensive efforts, be added to your reference source as follows: Derksen et al. (1982) and Simpson et al. (unpublished manuscript).

Page 82, line 7. We suggest deletion of the word "non-breeding." Not all white-fronted geese molting in the Teshekpuk Lake goose molting area are non-breeding birds. Many are failed breeders or birds with young.

Page 82, line 10. Taverners is not a race, but a subspecies of *Branta canadensis*. Since the composition of the molting flock on the Cape Halkett area undoubtedly includes *Branta canadensis parvipes* as well as *B. c. taverneri* (King and Hodges, 1979), we suggest that references to Taverners race or specific subspecies be deleted.

Page 82, lines 14-16. This sentence does not accurately reflect the referenced data. The figures 2,500 brant, 1,000 white-fronted geese and 1,700 Canada geese are only minimal figures since Derksen et al. (1979) cited only flock size categories, (i.e., 1-100, 101-500 and 500 birds). Actual numbers of birds on individual lakes within the hypothetical development field could be much larger (Derksen, 1978). Disturbance to molting geese could exceed the boundaries of the Smith River field. The entire population of brant (i.e., 30,000+ birds) in the Teshekpuk Lake area could be affected by such activity.

Page 82, Table IV-2. We question the value of attempting to predict impacts quantitatively in this manner. We suggest deletion of Table IV-2. If it is used in the final EIS, it would be beneficial to know the relative significance and differences between "short-term" and "long-term."

Page 82, lines 29-30. We suggest deletion of this sentence in the final EIS. Black brant nest throughout the Teshekpuk Lake area and along the entire Arctic Coastal Plain province (Derksen et al. 1981).

Page 83, lines 3-5. Because of the many assumptions required to arrive at these arbitrary figures, we believe they are of little value in predicting the impacts likely to occur with development. We suggest that you consider deletion of the entire section entitled "Summary Hypothetical Impacts for Geese."

Page 88. Deletion leasing will not benefit species. The purpose of deletions is to mitigate or lessen the impacts of leasing in NPRA. At best, the species in question will maintain their current status.

Page 102, line 6. Deferment of Area 8 (Plate 5) as an area of FWS waterbird research is incorrect. The area that is being considered for intensive study is to the north; the Fish Creek delta and coastal marshes.

#### Summary Comment

We believe the proposed preferred alternative will not adequately protect the surface resources of NPRA. At a minimum, areas deleted from leasing should include: the entire Teshekpuk Lake and the surrounding area as described in

13.

13. Final EIS Chapter Four, p. 79, has been appropriately revised to reflect these comments.


14.

14. Final EIS Plate One, last page, and appropriate portions of the text have been altered to correct this error.

Derksen, Weller, and Rothe (1979), an expansion of the Western Arctic Caribou Herd's "core calving area" to include the area east to the headwaters of the Meade River, south to the headwaters of the Colville, Kokolik, and Utukok Rivers, and west to Point Lay. Areas 1, 2, and 3 designated for no surface occupancy should be deferred, preferably deleted, due to their high value to migratory shorebirds and waterfowl.

We appreciate this opportunity to comment. My staff will be available to discuss our concerns.

Sincerely yours,

  
Regional Director

15.

15. See the Chukchi and Beaufort Sea coastal SMZ's on Plate One, last page, exclusive of the Teshekpuk Lake Area. The Final EIS Preferred Alternative, p. 126, (see Chapter Five and Plate One, last page) adequately provides for the conservation of other values while allowing for petroleum development under a multiple use management ethic. The Waterbird Discussion Panel (Gilliam and Lent, 1982) did not recommend the coastal areas for deletion or deferral, with the exception of the Fish Creek Area. On the Chukchi Sea coast, much of the highly valuable waterbird habitat is contained within the Alaska Maritime NWR under your agency's jurisdiction and is not subject to lease until your agency completes a compatibility determination.

#### LITERATURE CITED

- Derksen, D. V. 1978. Summary of Teshekpuk Lake aerial goose surveys (1976-1978). Unpublished report. U.S. Fish and Wildlife Service, Anchorage, Alaska. 21 pp.
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- Simpson, S. G., M. E. Hogan, and D. V. Derksen. (In Prep.) Behaviour and disturbance of moulting Pacific black brant in Arctic Alaska. U.S. Fish and Wildlife Service MS. 18 pp, 5 tables, 3 figs..

JOHN R. SWANSON  
P. O. Box 922  
Berkeley, Calif. 94701

November 30, 1982.

Rec'd  
12-8-82  
BK

Mr. Jerry C. Johnston,  
NPR-A Program Manager  
Bureau of Land Management - Alaska  
Anchorage, Alaska 99513

Dear Mr. Johnston:

Please accept my comments, as follows, concerning the -  
Draft Environmental Impact Statement, Oil and Gas Leasing and Development "National Petroleum Reserve - Alaska"  
which is subject of my opposition to any and all forms of oil and gas leasing and development in this  
National Petroleum Reserve - Alaska.

As even many minimal development of such resources or in fact, any resource development of a  
surface or sub surface type will primarily decimate not only the so-called development area  
but a vast surrounding area requiring a major environmental - biological - breakdown that  
cannot be repaired.

I first visited this area following the Second World War, and have continued to believe over the  
decades that this current Reserve obviously contains wildlife, fish, birds, trees, botanical, geologic  
cultural resources of National and international importance. A magnificent intact  
segment of our nation's very fragile natural heritage lands. Lands now menaced by threat on  
this decimated planet.

Yet, the plans for this Reserve include the substantial decimation of such highly valuable  
natural land and water resources. Even the such lands - waters provide a vital and healthy  
refuge for man, and for all life on this earth. One of the very last of this world's pristine areas,  
now scheduled for destruction.

I urge this agency - Department and the Congress of the United States to save this grand land, the  
National Petroleum Reserve - Alaska.

And to achieve such objective by affording Wilderness status - with acreage - to the following areas, with  
inclusion in the National Wilderness Preservation System;

• Be Long Mountain - entire foot hills	2,100,000
• Ute Lake River Uplands	5,250,000
• Seldovia Lake	1,500,000
• Colville River Valley	3,000,000
• Kachemak	835,000
• Kupuk River	3,450,000
• Uklutch River	2,000,000
• Arctic Ocean Banks and beyond and coast	1,000,000

Also, to include the remainder of this Reserve as to the Wilderness status.

Clearly as Wild Rivers the following areas are included in the Wild and Scenic Rivers System;

• Ute Lake River • Colville River • Kupuk River • Uklutch River • Arctic Ocean Banks and beyond and coast  
• Kachemak • Seldovia Lake • Be Long Mountain • Ute Lake River Uplands

Develop a system of areas of critical environmental concern, critical habitat, archaeological sites - areas,  
historical, biological, scientific, educational and historical areas - sites and other land management areas.

So establish a Designated National Wildlife and Wilderness Reserve of some 25,000,000 acres, including,  
a water - buffer zone. So preserve the natural land, water and living resources of this current  
petroleum reserve. I urge the joint administration of the National Park Service and the U.S. Fish and Wildlife  
Service.

Let us remember that when we have our natural lands, we have America!

Sincerely,  
J.R. Swanson

#### Response to Swanson's Comments

P.L. 96-514 precludes designation of wilderness areas within the Reserve. The Preferred Alternative, p. 126, provides for retaining the Congressional prerogative to designate wild and scenic rivers within the Reserve. The management of the NPR-A has been assigned to the BLM as a multiple use area. Petroleum development is one legitimate multiple use, but it will not preclude other legitimate uses.



### SECTION THREE - STATE OF ALASKA COMMENTS

# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

### DIVISION OF PARKS

December 28, 1982

File No. 1130-9-4

Mr. Fred Wolf  
Acting State Director  
Bureau of Land Management  
Alaska State Office  
701 C Street, Box 13  
Anchorage, Alaska 99513

Dear Mr. Wolf:

We have reviewed the Draft Environmental Impact Statement of Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska. The standard contract stipulations (Section 2(r)(3)) are clear and strong, particularly the requirement that areas to be impacted be surveyed prior to lessee activity, if it is determined that archaeological values may exist in those areas. We would be happy to assist in such determinations if requested. We are familiar with BLM's monitoring of exploration activity. This fine effort has, to our knowledge, resulted in very little or no significant adverse impact to cultural resources, and we have every reason to expect your agency to continue in that direction.

Please note that some tracts (e.g., 446, 448, 497 and 499) are extraordinarily rich in archaeological sites. The BLM may wish to delete such tracts unless they are expected to be keenly sought by lessees.

There are two other points that we would like to touch on:

- 1) We cannot agree with the statement on page 36 that "given how little is known of the prehistory of the NPR-A, virtually all of the NPR-A may qualify for NRHP listing under the criterion 'likely to yield information important in prehistory or history (36 CFR 60.6d)'." We can perhaps understand the reasoning behind this statement in that there are hundreds, perhaps thousands, of significant archaeological sites in NPR-A. On the other hand, there are many square miles that contain no cultural resources, making it difficult to support a National Register district nomination, including all of NPR-A.
- 2) Your cover letter to the DEIS states that there will be "no effect on any property on or eligible to the National Register of Historic Places." While it is true that the provisions for cultural resource identification and evaluation are very good, this statement may be premature. "No effect" determinations are covered under 36 CFR 800.3(a). Effects include such things as changes in land use patterns and population density which are likely to be unavoidable in this situation. However, with mitigation measures as outlined in the DEIS, "no adverse effect" determinations are much more likely. We recommend that such determinations be made on a case-by-case basis.

1017-11-1916), m7B  
BILL SHEFFIELD, GOVERNOR

619 WAREHOUSE DR., SUITE 210  
ANCHORAGE, ALASKA 99501

PHONE: 274-4676

BUREAU OF LAND  
MANAGEMENT  
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ANCHORAGE, ALASKA

Mr. Fred Wolf  
December 28, 1982  
Page 2

As always, we appreciate your agency's sensitivity toward Alaska's cultural resources, and we hope that you will contact us if we can be of assistance.

Sincerely,

Judith E. Marquez  
Director

*Tim Smith, Deputy*  
by: Ty L. Dilliplane  
For: State Historic Preservation Officer

cc: Beth Walton

TAS:ces

Phone 2 - 3694

**DRAFT**

Rcd NPR-A  
12/28/82  
debit

for your  
information  
to file

December 22, 1982

RECEIVED  
ANCHORAGE ALASKA  
DEC 27 9 05 AM '82  
BUREAU OF LAND  
MANAGEMENT  
MAIL ROOM

Mr. Jerry Wickstrom  
NPR-A Program Manager  
Bureau of Land Management  
Alaska State Office  
NPR-A (916)  
701 C Street, Box 13  
Anchorage, AK 99513

Dear Mr. Wickstrom:

The State of Alaska appreciates the opportunity to review the Draft Environmental Impact Statement (draft EIS) for Oil and Gas Leasing and Development in the National Petroleum Reserve in Alaska (NPR-A) and the manner in which the NPR-A Program Manager and his staff have worked with the State in coordinating the review of this project. We also appreciate the additional time that has been given to the State to provide comments.

The State's coastal management consistency review of the proposed NPR-A 5-year Leasing Program will occur upon receipt of a written determination of consistency of this proposal with the Alaska Coastal Management Program. A timely concurrence with your anticipated statement of consistency is likely to occur if the State's concerns and comments are adequately addressed during preparation of the final EIS. Our comments were developed with State coastal management standards in mind.

The following general comments are offered for your consideration during development of the final EIS and to provide assistance in structuring the NPR-A oil and gas leasing and development program. Page specific comments are provided in Enclosure 1.

#### Leasing Alternatives

##### 1. No Surface Occupancy and Design Solution Leasing

No surface occupancy leasing and design solution leasing are not well enough defined in the draft EIS to indicate either the degree of natural resource protection that they will afford, or the nature of constraints that will be placed on oil and gas exploration and development. No surface occupancy would be more appropriately termed limited surface occupancy. Additional clarification is required in the final EIS with regard to 1) limits placed on exploration and their application to the operation of producing wells, 2) types of facilities that will be allowed

in the development phase of oil and gas related activities, 3) types of design solutions that are possible or likely, and 4) whether pipeline burial is a feasible design solution for mitigation of impacts on caribou.

In this regard, the State generally prefers that leasing proceed in the same manner as practiced in the past on State lands and federal OCS lease areas.

## 2. Deferral versus Deletion

The NPR-A draft EIS (pages 100 - 102) makes the distinction between areas to be "deferred" from leasing until 1992, and areas to be "deleted" and not scheduled for leasing until:

- "a. an analysis of the need for withdrawal of these areas is completed;
- b. if the analysis of (a) above indicates that the lands are not suitable for withdrawal, then the lands will not be scheduled for lease until a public process has been used to determine when the lands should be leased and what best management practices should apply; and
- c. that during the withdrawal review period, no rights-of-way would be granted across these deleted lands."

The difference between these two leasing methods is confusing and should be combined into a single "deletion leasing" option, subject only to those analyses described in items a and b above. Item c, prohibition of rights-of-way, could substantially affect the development of adjacent lands and should therefore be deleted. Any request for a rights-of-way access should be subject to an environmental analysis prior to approval. Furthermore, the analyses specified in items a and b as well as a decision on the feasibility of leasing these areas identified for "deletion leasing" should be completed within five years so that a definitive decision to lease or withdraw the areas in question can be made.

Under this revised "deletion leasing" option, the State recommends the inclusion of Areas 4, 5, 6, 7, 9 and 10 identified on Plate 5 in the draft EIS. The State also recommends expanding portions of these areas to include additional acreage identified on the map attached as Enclosure 2. The supporting rationale and justification for these recommendations is provided in the following discussion on critical habitats.

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## Critical Habitats

### 1. Utukok Core Caribou Calving Area

The herd size and areas used for calving by the Western Arctic Caribou Herd are not static. The location of caribou calving areas are also

During the past two decades calving has annually occurred both outside and inside the core calving area identified in Area 2 on Plate 4 of the draft EIS. Department of Fish and Game records indicate that during most years, as much or more calving has been documented south of Area 2 as within it. The core calving areas described in the draft EIS represents calving concentration areas observed at a time when the Western Arctic Herd was approximately one quarter its historic size and only one third of the present population size. Furthermore, the core area identified in Area 2 (Plate 4) is about 1,600 square miles less than that recommended for protection by NPR-A Caribou/Waterbird Impact Analysis Workshop participants at a May 11-13, 1982 meeting.

To adequately protect critical habitats and provide for expansion of the Western Arctic Herd, the State recommends "deletion leasing" of Areas 4, 5 and 9, as identified on Plate 5 of the draft EIS, and the additional acreage depicted on the map in Enclosure 2. Deferred leasing of Area 4 will also serve to maintain current grizzly bear densities in southwestern NPR-A. These areas should be leased under the revised conditions described in the "deletion leasing" option previously recommended by the State under leasing alternatives. With regard to rights-of-way access (e.g., subject to an environmental analysis), and in order to protect caribou migration routes, the State strongly encourages that any access occur north of the area identified in Enclosure 2.

## 2. Teshkepuk Lake

The draft EIS proposed deletion of approximately ten townships northeast of Teshkepuk Lake. This region is extremely important to the preservation and protection of numerous wildlife species. The Teshkepuk Lake area is internationally important as a brant molting area and comprises the entire range for the Teshkepuk Caribou Herd. It is also an important subsistence use area, has been documented as important denning habitat for polar bears and arctic fox, and is important for ducks, geese, swans, loons, and shorebirds.

Given the importance of this region, the State supports "deletion leasing" of Areas 6, 7 and 10 identified in Plate 5 of the draft EIS. These areas should be leased under the revised conditions described in the "deletion leasing" option previously recommended by the State under leasing alternatives.

## 3. Kaseqaluk Lagoon

Kaseqaluk Lagoon and adjacent nearshore waters provide critical calving, rearing and feeding habitat for the largest summer concentration of belukha whales in the Alaskan Chukchi Sea. When whales are present in these areas, they are highly susceptible to noise and disturbance from low flying aircraft or boat traffic. Such disturbance could result in displacement of whales from traditional calving and summering areas. In addition to belukha whales, Kaseqaluk Lagoon also supports large summer-fall con-

centrations of spotted seals. Spotted seals will haul out on tidal flats, sand and gravel bars, or any low point of land extending from the mainland. Finally, Kasegaluk Lagoon is also one of the most important areas to waterbirds on the entire Chukchi Sea coast.

Given the above considerations, the State recommends that the final EIS contain a stipulation that provides seasonal protection to this area for all tracts leased within one mile of Kasegaluk Lagoon.

#### 4. Colville River

The Colville River and its tributaries support the largest concentration of moose north of the Brooks Range. The majority of these animals winter along the central Colville River, its tributaries, and the upper drainages of the Ikpiukuk and Titaluk Rivers. The riparian shrub communities that comprise the critical moose habitat in these areas is limited. Any alteration of these habitats could result in proportional reductions to local moose populations.

Although existing stipulations protecting peregrine falcons also coincidentally provide some protection to moose habitat, additional protective measures may be necessary. The final EIS should discuss potential impacts of development on moose and, if necessary, develop appropriate stipulations to provide adequate protection to important moose habitat. This is particularly important in the event that the Colville River does not receive Wild and Scenic River status.

#### Cummulative Impacts and Timing of Sales

The draft EIS does not sufficiently address the timing and cumulative impacts of leasing in NPR-A with other existing or proposed leasing programs on the north slope. Proposed federal offshore lease sales adjacent to the NPR-A include OCS Lease Sales 85 and 109 (Barrow Arch) and sales 87 and 97 (Diapir Field). Proposed State lease sales adjacent to the NPR-A include Sale 43 (Colville Delta to Pitt Point) and Sale 52 (Smith Bay) in the nearshore Beaufort Sea. Given the frequency of lease sales and the large amount of acreage being considered for lease in the NPR-A, the timing of sales and potential cumulative impacts with other proposed State and federal lease sales warrants further discussion in the final EIS.

Furthermore, the prohibition of rights-of-way access through large areas being considered for "deletion leasing" could substantially affect the feasibility and cost effectiveness of developing adjacent lands. The necessity to route roads or pipelines around these areas could prohibit development in portions of adjacent sale areas, substantially increase development costs, or result in a greater amount of habitat being impacted (Note: In our earlier discussion under leasing alternatives, the State recommends deleting the restriction on rights-of-way access for those areas being considered for "deletion leasing").

December 20, 1982

Local Plans and Policies

The North Slope Borough has taken an active interest in oil and gas leasing and development activities scheduled to occur in their area. Their primary interest has been to maintain the traditional values and lifestyles within an atmosphere of responsible resource development. These objectives have been incorporated into the preparation of the North Slope Borough's Coastal Management Plan, scheduled for review and approval by the Coastal Policy Council by mid-1984. Once approved, the Borough's Plan will serve as the basis for consistency reviews, as is required under Section 307 of the Coastal Zone Management Act. In addition, the Borough has recently adopted a comprehensive plan which provides management guidance for areas within their jurisdiction.

We recommend that you maintain a cooperative relationship with the Borough and the State on continuing NPR-A developments.

The draft EIS does not discuss the BLM's plan for coordinating with these local planning efforts. We recommend that the final EIS include a discussion of BLM's intended approach and method for coordinating with local and State planning efforts as the NPR-A leasing program proceeds.

We appreciate the opportunity to review the draft EIS for NPR-A and look forward to your consideration of our comments in the final EIS. Please contact this office if we can be of any further assistance as you develop the final EIS.

Sincerely,

James M. Souhy  
Director

BUREAU OF LAND  
MANAGEMENT  
NORTH SLOPE  
ANCHORAGE, ALASKA  
DEC 27 9 05 AM '82

cc: Doug Lowery, DEC  
Doug Redburn, DEC  
Mike Wheeler, DEC  
Scott Grundy, DF&G  
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Mike Arruda, Law  
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Eugene Brown, Mayor, North Slope Borough



Mr. Jerry Wickstrom

-6-

December 22, 1982

cc: Frank Bester, City of Wainwright  
City of Nuiqsut  
Nathaniel Olemaun, Mayor, City of Barrow  
Edward Hopson, President, Arctic Slope Regional Corporation  
Atkasook Corporation  
Ukpeagvik Inupiat Corporation  
Klukpik Corporation  
Olgoonik Corporation  
David Cline, National Audubon Society

bcc: Commissioner Katz, DNR  
Acting Commissioner Collinsworth, DF&G  
Commissioner Neve, DEC  
Lennie Boston, Special Assistant, Office of the Governor

JMS:RS:sa

Pages 7 - 10, Vulnerability and Risk Factor Analysis

The vulnerability and risk factor analysis which appears on pages 7-11 of the draft EIS oversimplifies a complex situation. The analysis uses a binary logic system to determine the potential risk of oil and gas development to certain species of wildlife. The result is a determination that a species is categorized as either "type one" - recommended for comprehensive EIS analysis, or "type two" - recommended for a moderate level of treatment.

If a "type one" species such as caribou or geese is vulnerable to oil and gas exploration, then the species that prey upon it are also directly subject to impact. Therefore, species such as wolves, wolverine and foxes should also receive ratings of 1.0.

The NPR-A 105(c) study (Vol. 6, page 112) states that, "Swans probably more than any other species would be easily displaced by human activities... Increased human activity during oil and gas development will infringe upon the habitat of swans." Therefore, it would also seem appropriate for whistling swans to receive comprehensive analysis in the final EIS.

Page 9, Table I-3 - Resources at Risk

Additional resources at risk that should be discussed in the final EIS include moose, spotted seals, belukha and bowhead whales.

Page 11, Discussion Tracts

The draft EIS states that, "EIS preparers divided the NPR-A lands which have moderate to high perceived oil potential into 500 discussion tracts." The rationale and supporting data used to classify these areas as being of moderate to high oil potential should be discussed in the final EIS.

Page 13, Section I.B. - Affected Resources

While a relatively small portion of the NPR-A is likely to be leased and developed, the degree of impact to biological resources will depend upon the timing and geographical extent of that development.

Page 19, Teshekpuk Lake Herd

Additional time and studies are needed to determine this herd's range and movements. A BLM report by P. Reynolds, entitled "Preliminary Report on the Status of the Teshekpuk Caribou Herd" contains current information on the status of this herd.

Page 42, Explorat

Insufficient evidence is available to support the notion that habituation of caribou to industrial development is occurring.

Page 50, Development and Operation

The discussion of rights-of-way for roads, flowlines, and airstrips is not consistent with existing development activities on the North Slope.

For example, the pending application for a right-of-way lease for the Kuparuk pipeline requires 450 feet during the construction period and 150 feet during operation. The proposed design for the Kuparuk airstrip is approximately 6,500 feet long and 150 feet wide with additional material placed for taxiways, parking, warehouses, hangars, glide-slope indicators, and other facilities necessary for safe all-weather operations. It is likely that any airstrips constructed to support production in NPR-A would be similar.

Page 52, Vehicle Traffic

The draft EIS estimate of only 12 to 15 trucks per month traveling to and from a production area is highly optimistic. During discussions between industry and regulatory agencies regarding the Kuparuk Industrial Center, vehicular traffic along the Spine Road between Prudhoe Bay and Kuparuk was estimated, by an industry representative, to average 500 vehicles per day (April 1982). While we recognize that operations in Prudhoe and NPR-A will not be directly comparable, it appears likely that the draft EIS figures are low.

Page 58, Minimum Requirements

The minimum requirements, if used to the extent practicable and if closely monitored and applied in conjunction with proposed stipulations, could be adequate to mitigate adverse environmental effects of exploration anywhere in NPR-A. Companies who wish to engage in exploration activities should be encouraged to conduct site-specific studies in biologically sensitive areas.

Proposed Stipulation No. 1 states that, "The applicant...will specifically identify and map all significant fish and wildlife use patterns within the vicinity of any proposed activity site." The words "significant" and "within the vicinity" should be more precisely defined. The former term should not be construed to mean only those species utilized for subsistence or classified by BLM as "noteworthy," but should include ecologically important species as well. The term "within the vicinity" should be more operationally defined to specify the areal extent of the proposed surveys.

Page 59, Stipulation for Swans, Ducks, and Shorebirds

While this stipulation provides for the protection of waterbirds during exploration and development, it does not provide for cessation of exploration or production activities during critical waterbird life stages. The implications and consequences of conducting drilling activities during critical periods should be more fully explored in the final EIS. The word "will" should be substituted for the word "may" in the last sentence of the first paragraph of the stipulation for whistling swans, ducks, and shorebird protection. The "designated area" referred to in the second paragraph can and should be identified at this time. This designated area should include all high density duck, geese, shorebird and swan habitat within the proposed sale area. Maps of this high density habitat may be found in the BLM's NPR-A 105(c) Study Report #2, Section 6, Plates 7,8 and 10.

Page 60, Wolverines

The following statement should be added to the stipulation for wolverine protection: "Snowdrifts utilized by wolverines will have a 1/4 mile no-activity buffer zone from February 15 to May 15.

Page 61, Dall Sheep

The word "generally" should be omitted in the stipulation to protect Dall sheep.

Page 61, Fisheries

This stipulation treats subsistence use as the sole criteria on which to base the requirement for a 200 meter setback. This should be expanded to include important gravel bed spawning grounds and critical overwintering areas. In addition, residual impacts to fisheries could be minimized by utilizing manuals (best management practices) available from the Alaska Department of Environmental Conservation on dredge and fill activities and from the U.S. Fish and Wildlife Service on gravel extraction and site rehabilitation.

Page 62, Table III-10 - Air Quality

Potential impacts on air quality may be mitigated by application of air quality guidelines contained in the Proceedings of the Symposium on Surface Protection, U.S.D.I., Bureau of Land Management, 1977, Additional recommended stipulations to protect water quality may be found in the same reference (pp. 248-250).

The source of data used to develop Table II-10 should be identified.

Page 62, Water Quality

The State presently prohibits the discharge of produced waters or drilling muds to lakes, streams, rivers and critical wetlands.

Page 65, Impact: pon Geese

The draft EIS implies that protecting several valuable coastal habitats ensures adequate protection to geese in the event that other important habitats are developed. However, the impacts of development should always be minimized to the maximum extent practical. Even the most intensive development should proceed with a consideration for protection and possible restoration of habitat once development is completed.

Page 68, Teshekpuk Lake Developments (caribou)

The draft EIS predictions of the levels of impacts and responses by caribou to development are highly speculative. For example, while exchanges between members of geographically distinct caribou herds have occurred, these occurrences are not common. Furthermore, there is no evidence to indicate that these exchanges are permanent. The reasons caribou maintain traditional calving areas are not fully understood. Assumptions that caribou will adapt to new calving grounds and that recruitment will maintain viable populations are still speculative at best.

While it is true that herd management (e.g., predator control, subsistence use and sport hunting restrictions) could reduce levels of impact, the concept of restricting traditional caribou harvest in order to mitigate problems caused by industrial development is not an acceptable management practice.

Page 69, Summary of Hypothetical Impacts

Analytical Case #2 discusses the potential impact of extending the Kuparuk road into NPR-A. Potential impacts to the Central Arctic Caribou Herd (CAH), as a result of expanding the Kuparuk Road, are questionable considering that 1) the present road extends over half of the distance between the Kuparuk and Colville River, 2) north-south roads to Milne Point and Oliktok Point may isolate sections of the CAH calving area, and 3) the proposed Sag Delta road may isolate another significant portion of prime calving area. Although the CAH could lose its identity, it would not strictly be the result of expanding the Kuparuk road as the draft EIS indicates.

Page 70, Utukok River Area Developments

The draft EIS states that, "Roughly 150 square miles of the 1,100 square mile core calving area would be subject to occupancy (e.g., by development) and at least partial displacement of those caribou that normally use it," and "there is a probability of over 90 percent that almost all adult females in the population would be in or encounter the fields at least once immediately before, during or after giving birth... Overall, the effect will be to alter the movements and distribution of cows and associated caribou over the calving grounds..."

Although these statements are based on hypothetical development scenarios, they should be supported in the final EIS by data that addresses the probability of finding a field(s) of the size that would require 150 square miles of occupancy. The discussion should also explain the basis for the determination that there is a 90 percent probability of adult female caribou encountering such hypothetical fields.

The draft EIS bases predictions of grizzly bear population reductions on habitat loss. Habitat is not presently a limiting factor in this area, however impacts postulated in the draft EIS have been underestimated since losses will result from conflicts that arise from habituation of bears whose territories overlap oil field developments.

Grizzly bears occupy large and overlapping territories. More bears than the 0.51/mi. estimate in the draft EIS (per field) will contact development sites. Additional bears will also move into vacated territories resulting from the removal of nuisance bears. From 1971 to 1978, 13 black bears and 11 grizzly bears were destroyed intentionally or accidentally along the TAPS line from the Yukon River to Prudhoe Bay (12 additional grizzly bears were transplanted). Since then, 8 black bears and 3 grizzly bears have been killed. Available data indicates that grizzly densities in the southwest NPR-A may be twice that of densities along the TAPS.

An even greater potential impact to grizzly bears than conflict with or displacement by development, is the likely indirect impact due to demographic changes in the Western Arctic Caribou Herd. Impacts on the NPR-A bear populations can be minimized by (1) protecting the integrity of the WAH caribou calving grounds, (2) fencing construction and work camps and regulating refuse disposal, (3) enforcing prohibitions against feeding wildlife by workers or truckers in the field, and (4) consolidating pipeline and transportation corridors, field camps, and development facilities as much as possible.

Consideration should be given to developing an environmental training stipulation, designed to prevent problems such as those pointed out on page 77 of the draft EIS involving worker/bear encounters.

#### Page 83, Peregrine Falcons

The final EIS should discuss the importance of potential nest sites since 1) locations of historic nest sites may not always be apparent, 2) room for future expansion must be accommodated if peregrines are to recover to non-endangered levels, and 3) habitat for other cliff nesting raptors must be protected so as not to displace the peregrine falcon from potential nest sites.

The predicted increase in recreational use of the Colville River and subsequent impacts on nesting raptors is questionable. Even with road access to NPR-A oil fields, the logistics of access will still necessitate air charters. Furthermore, the assumption on page 95 that all 335 canoeists who wish to spend more time in this activity would do so, and that they all would choose the Colville River, is unrealistic.

Page 89, Impact to Key Species (Caribou)

Area 5 depicted on Plate 5 has been documented as a heavily used caribou calving area. All or part of this area was heavily utilized by caribou during 1965, 1966, 1967, 1969, 1980, 1981, and 1982. High density calving is also documented for portions of Area 4 depicted on Plate 5 during 1975, 1976, 1977, 1978, 1980, 1981 and 1982.

Page 91, Proposed Wildlife Protection Stipulation

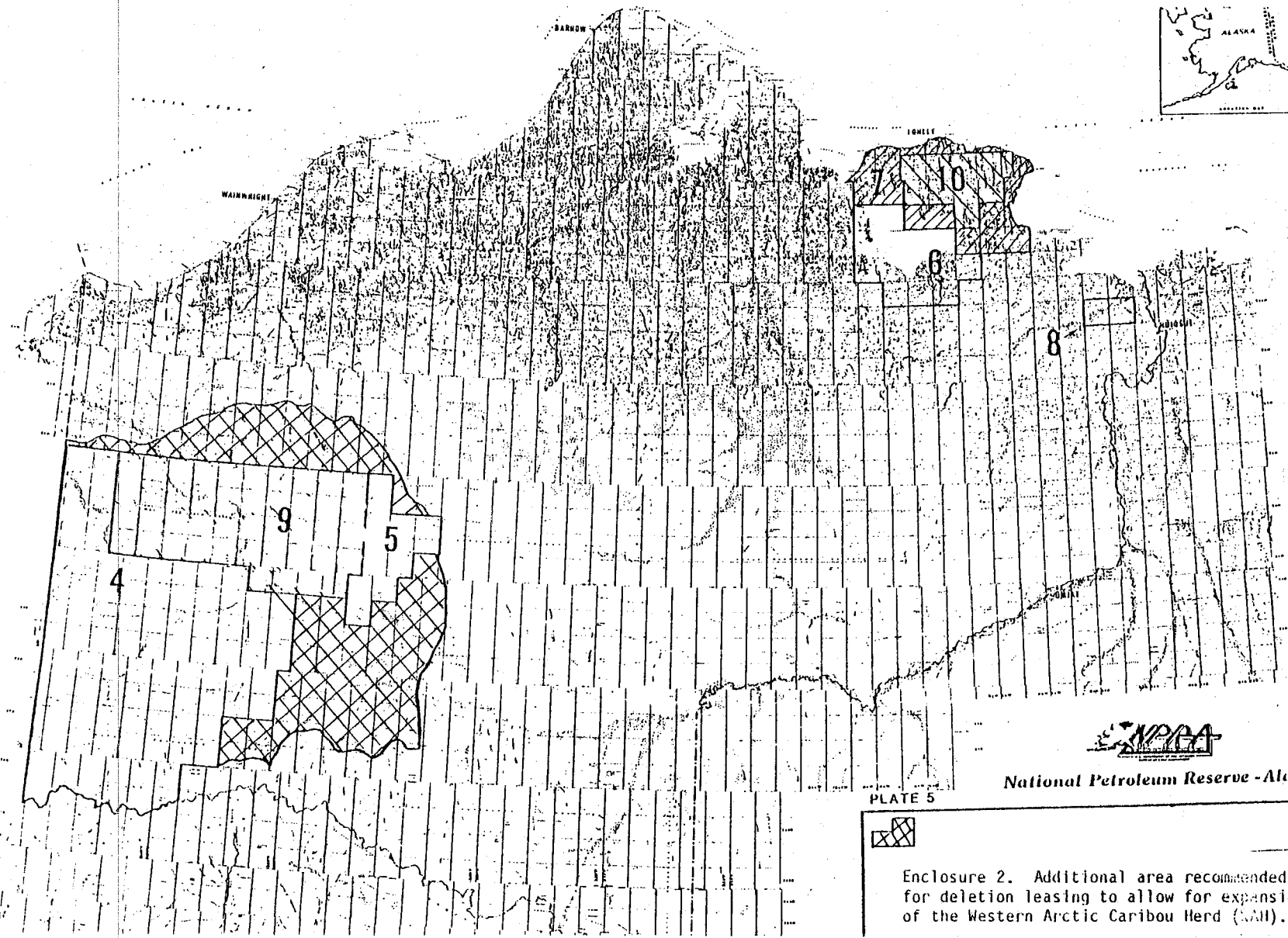
This requirement of the applicant to map wildlife "use patterns" should include historic as well as current patterns since wildlife movements vary annually and seasonally. Facilities must be sited so as to provide adequate protection to wildlife based on historic and current habitat use and migration routes.

Plate 9, Standard Leasing Requirements

The Standard Leasing Requirements, as presented in Plate 9 of the NPR-A draft EIS, should reflect current State standards. For example, Section 3, paragraph 2 of Plate 9 should read as follows: "Solid waste disposal on artificial islands or in waters of the lease area is prohibited. Discharge of produced water and drilling muds and cuttings into freshwater bodies is prohibited. Onshore mud sumps or reserve pits shall be bermed or otherwise fully contained to prevent leaching to adjacent water bodies. Discharge of produced waters into marine waters of less than 10 meters depth is prohibited. Discharge of non oil-contaminated drilling muds and cuttings to marine waters is approved if effluents are shown to be non-toxic and can be adequately dispersed."

Enclosure 2. Map Identifying  
Additional Areas to be Included in the  
Deletion Leasing Option for Protection and Expansion  
of Critical Caribou Habitat  
(attachment to Jim Souby's December 22, 1982 letter  
to Mr. Jerry Wickstrom)





National Petroleum Reserve - Alaska

PLATE 5



Enclosure 2. Additional area recommended for deletion leasing to allow for expansion of the Western Arctic Caribou Herd (WACH).